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RANDOM RECORDS OF A LIFETIME,

DEVOTED TO SCIENCE AND ART, 1846-1930

BY W. H. HOLMES

VOLUME VI

Section I The Prehistoric Washington.

The Piney Branch Indian Bowlder Quarries, 1889-94

The Site of the City of Washington, the Center of a Great Aboriginal Industry.

Section II The Soapstone Quarries of West Washington and Near-by Virginia.

Section III Aboriginal Paint Mines.

Section IV Ethnic Lay Figure Groups.

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VOLUME VI.

SECTION I THE PREHISTORIC WASHINGTON.

The Piney Branch Indian Bowlder Quarries, 1889-94.

The Site of the City of Washington was the Center of a Great Aboriginal Industry.

PREHISTORIC WASHINGTON

PINEY BRANCH BOWLDER QUARRIES

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(5) ? Indroducing ?

SMITHSONIAN INSTITUTION

BUREAU OF ETHNOLOGY

WASHINGTON, D. C. Sept. 24, 1890.

Mr. W. H. Holmes,

Archaeologist,

Bureau of Ethnology.

Sir.-

In carrying on the Archaeologic survey of the Potomac and neighboring valleys you are hereby directed to make the necessary journeys and to secure and transport such assistants as are required for the proper conduct of the work under your charge.

Yours, with respect.

Director.

G.P.O. JUL 6 1939
DIRECTOR
GEOLOGICAL SURVEY.

1. Boiling Ears of Corn in Virginia in 1585–1588.
Drawing by John White of the Roanoke Colony.

USE OF THE EARTHEN POT IN BOILING

DRAWN BY JOHN WHITE, OF THE ROANOKE COLONY, 1585-1588

2. Piney Branch below the Indian quarries and near its junction with Rock Creek. Mt Pleasant occupies the highland at the right. about 187

In 1929 the city was built all around this
but the valley - for two or 3 miles. It was to become a part of Rock Creek Park
This valley also runs into the Rock creek only a few hundred yards below this point

INDIAN QUARRIES; BEGINNING OF MY WORK IN PINEY BRANCH, D. C.

In July 1889, at the instance of the Director of the Geological Survey, I resigned my place in that organization to accept a place as archaeologist, under the same direction, in the Bureau of Ethnology. It was intended that in the near future I should begin archaeological investigations along the Atlantic coast and I resolved to commence work at home - literally at home - for one of the most promising sites for archaeological research in the United States was only one and a quarter miles from my own doorstep in Washington. I allude to the quarry workshops of the local tribes in the Valley of Piney Branch.

But, aside from the convenience of the locality, there were other good reasons for beginning the work here. The relics found have a direct bearing upon questions of the early occupation of this continent - an occupation believed by many to have preceded that of the Indian. The questions involved are of the utmost importance and demand the fullest attention. The deposits of the refuse of stone shaping operations are of great extent and of unknown depth.

In September 1889 I began excavating on the Piney Branch site. A trench was carried across the principal group of sites, which had a width on the forest covered slope of hundreds of feet. The methods of quarrying and working

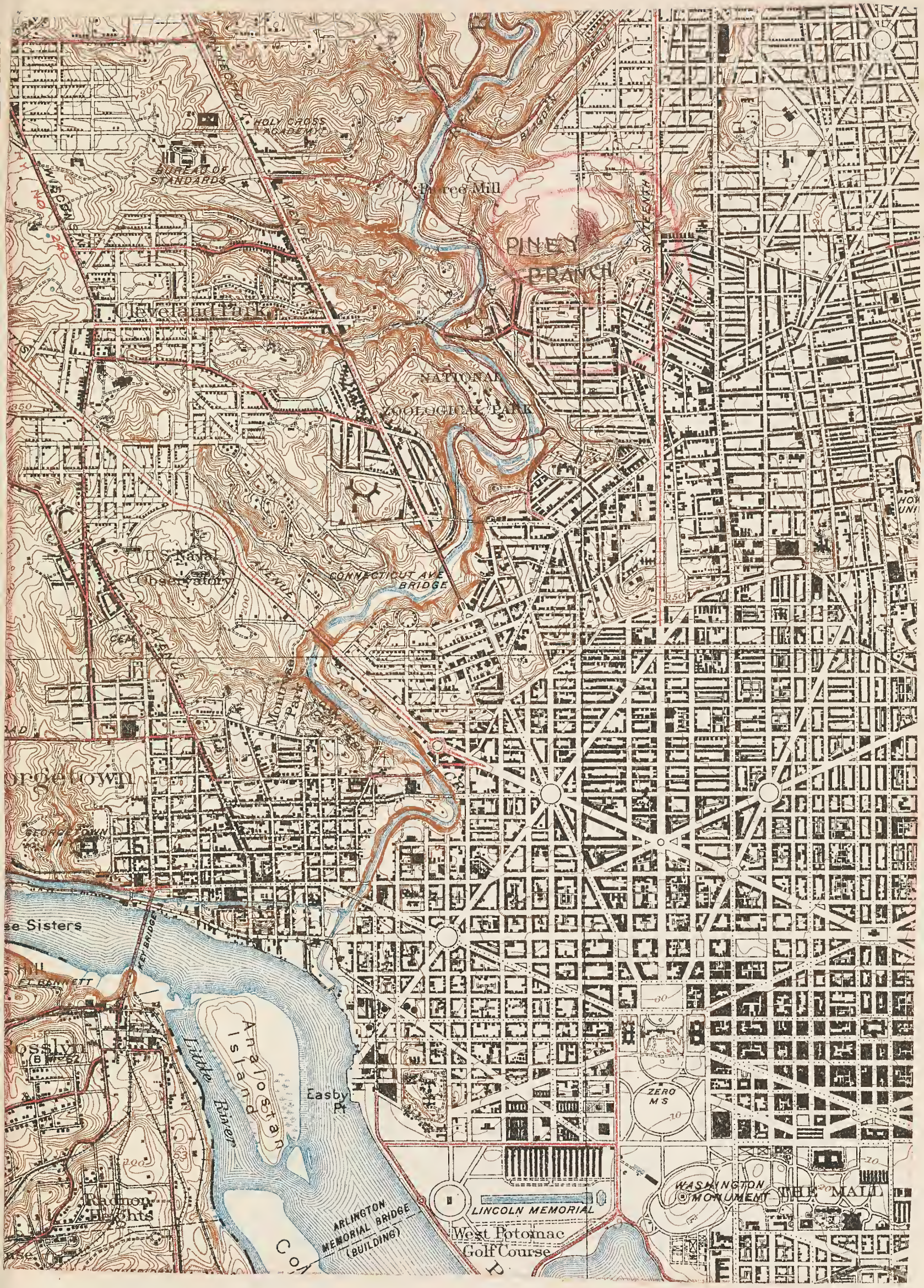
bowlders were studied, and hundreds of specimens were collected. Work was resumed the next spring, and five additional trenches were opened across widely separated portions of the quarries. Much additional information was collected, and many specimens were added to the collection. The chipped stones, the refuse and rejectage of the chipping work, occur in millions, but no single example of a typical finished implement was found. It is especially worthy of note that nature has no means of fracturing such hard and tough bowlders as make up the bowlder deposits; in the whole of Piney Branch and even in Rock Creek Valley there is not a chipped bowlder of average hardness that has not been held in the hand of an Indian workman. In June work was commenced on another group of quarries situated north of the new Naval Observatory, on the western side of Rock Creek. Very extensive quarrying and implement-making had been carried on at this place. The conditions and phenomena were practically identical with those of the Piney Branch site, and the same is doubtless true of many other sites within the city limits. The bowlder beds are of wide distribution and are the result of wear along the beach lines of river or bay when the water stood at the particular level.

See my two volumes, Bulletin 60 and Volume [illegible] of the Bureau of Ethnology.

BUREAU OF AMERICAN ETHNOLOGY
11th Annual Report, 1889-90.

"In the autumn of 1889 Mr. W. H. Holmes was directed to take charge of the archeologic field work of the Bureau. In September he began excavations in the ancient bowlder quarries on Piny branch, a tributary of Rock creek, near Washington. A trench was carried across the principal quarry, which had a width of more than 50 feet and a depth in places of 10 feet. The ancient methods of quarrying and working the bowlders were studied, and several thousand specimens were collected. Work was resumed in the next spring, and five additional trenches were opened across widely separated portions of the ancient quarries. Much additional information was collected, and many specimens were added to the collection. In June work was commenced on another group of ancient quarries situated north of the new Naval Observatory, on the western side of Rock creek. Very extensive quarrying and implement-making had been carried on this place. The conditions and phenomena were almost identical with those of the Piny branch site. Subsequently an ancient soapstone quarry near Tenleytown was examined. The ancient pitting corresponds quite closely with that of the bowlder quarries, and the condition of the pits indicated equal age." (Page XXVI)

"Mr. W. H. Holmes was chiefly engaged in the preparation of papers on the arts of the mound builders. Four elaborate papers have been undertaken by Mr. Holmes, one on pottery, a second on art in shell and bone, a third on textile fabrics, and a fourth on pipes. Three of these papers were well advanced toward completion at the close of the fiscal year. In addition to this work he has prepared several papers relating to his field explorations. These include a report on excavations in the ancient quartzite bowlder workshops and the soapstone quarries of the District of Columbia, and a rock shelter in West Virginia." (Page XXXIV)



PINEY BRANCH

Red patch quarry site

3. View in the ravine just above its junction with Piney Branch. The figure marks the spot where the trenching of the quarry slope was begun.

4. Where the work of excavation was begun.

5. Studying the problem of the trenching. The oak forest grows in the deposits of chipped stones although the surface is made up largely of unworked material from above.

6. This photograph shows the line of pittings carried up the slope. The deposit of rejectage was about four feet deep at the upper end where the third figure stands.

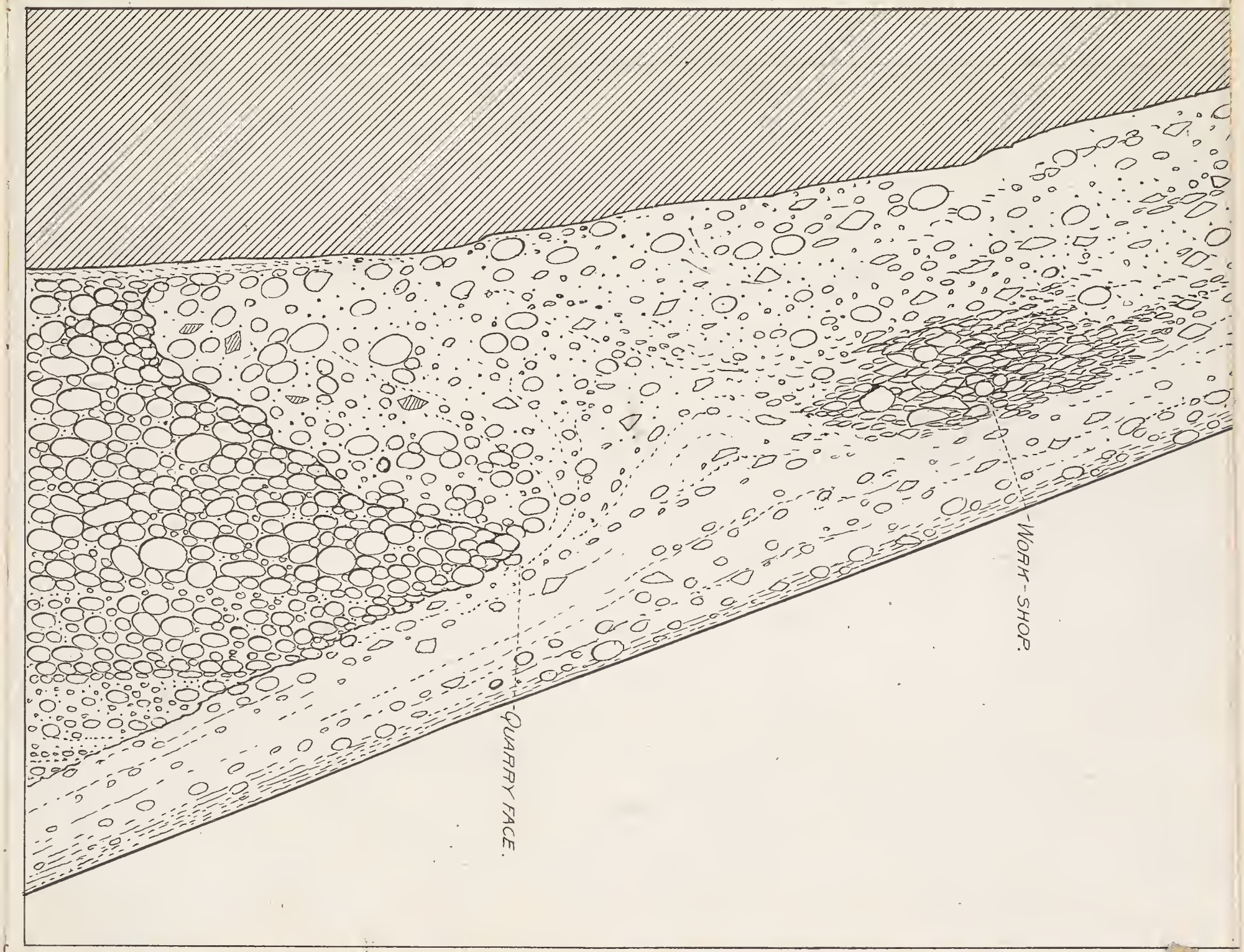
Holmes in an ocean of the "paleolithic" of Abbott, Putnam, Wilson and the rest of the early enthusiasts of American archeology. All are merely refuse of Indian implement making

7. A typical pocket of the workshop rejectage. Every chipped piece is the work of the Indian hammer. Few bowlders were left untested for material and flakeable qualities.

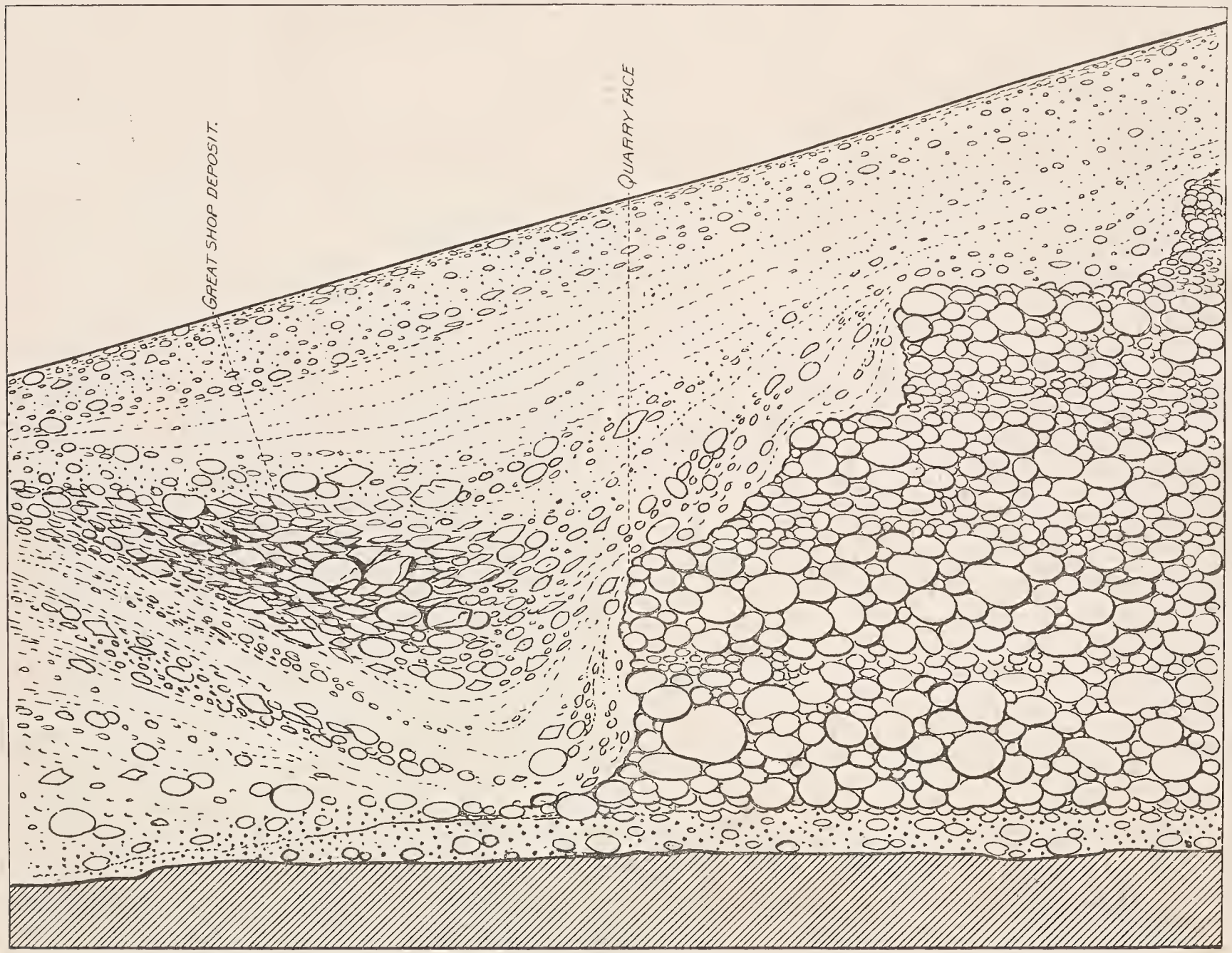
8. An oak growing in the heavy deposit of shop rejectage. Numerous examples of the partially shaped blades are seen. Near the center Is placed on end a typical blade reject, the failure being due to too great thickness. The thin blade was practically the only form sought.

9. Museum group illustrating the quarry shop work in Piney Branch.

Designed by W. H. Holmes and modeled by U. S. J. Dunbar.



10. Section of the quarry showing undermining of the bowlder bed and the deposit of flakage below where the roughing out work was carried on.



11. Section of the quarry trench exposing the quarry face and the shop deposit.

Fracture-- Although the masterpieces of the aboriginal sculptors are probably best represented by the highest achievements howsoever the method or style of the work, brief notice should be taken of the wonderful things accomplished by the simplest of all shaping processes and the initial discovery of the shaping arts, the chipping of stone by simple fracture. The Egyptians were the greatest masters of this branch in the world and the flint knives obtained from tombs of the Y century stand unsurpassed for skill in manipulation and the perfection of the shaped results. Our aborigines have, however, left some superb examples of their skill, examples of which are shown in figures 1 and 2. The incising process can deal only with soft varieties of stone and it had little place in the development of sculpture. It was this process, however, which roughed out the forms afterwards brought to a high

degree of finish by the crumbling and abrading processes.

Although the sculptural tools were largely of stone, the range of process was identical with that of the Greeks and Romans. Sculpture of the greatest periods, the range of articles made, and the subjects treated were hardly less extensive. Sculpture in relief and in the round came into use side by side, the two methods grading one into the other, while intaglio work was confined largely to pictographs and glyphic inscriptions.

In reviewing the sculptural work of the aborigines we can not pass over the carvings in wood, many of which deserve high praise but this branch may be reserved for subsequent treatment.

There is little in stone sculpture requiring attention north of the Valley of Mexico.

12. Lay Figures Showing Workmen Breaking and Chipping Boulders.

Some ground about unfinished

Fracture by the cast thereon

Rest Percussion

DIGGING INDIAN RELICS FROM THE PINEY BRANCH QUARRY.

/3. Holmes and Dinwiddie at work beginning the study of the Piney Branch Quarry. See Bulletin 60, Bureau of American Ethnology.

14. Lay figure group of bowlder quarrymen and implement makers on Piney Branch as they possibly appeared before the coming of the English settlers a few hundred years ago. The group was set up on the old quarry site.

15. Typical rejects from the Quarry refuse. Too great thickness or bad breakage was the cause of rejectage.

16. Blade making group at work employing two forms of pressure shaping.
as the workers appear in the Museum case

MAKING STONE WEAPONS.

National Museum Has Group Showing Indian Methods 300 Years Ago.

WASHINGTON, March 16.—Many new and attractive ethnological exhibits have been recently opened for inspection by the public in the new National Museum Building at Washington. One, known as the Quarry Group, represents a scene in the present District of Columbia before the coming of the white man. It shows a group of six Indians mining or quarrying rocks for utensils, weapons, &c., and shaping them for future use. This group is intended to illustrate the work carried on in the great quarries on Piney Branch not long before the arrival of the English, some 300 years ago, near the point where Eighteenth Street would cross that stream.

The man at the left is represented as employing a heavy wooden pike in prying up the larger boulders, while the second breaks them up preparatory to selecting fragments of suitable size and shape for implement making.

The third man roughs out the forms of the implements by means of quick, sharp blows with a boulder hammer, using either the selected fragments or the smaller boulders for the purpose.

The fourth workman trims the edges and shapes up the thin blades with an implement of bone or antler set in a wooden shaft. The flaking is accomplished by setting the point of this implement against the edge of the roughed-out blade and pressing it downward with a quick, strong movement, reinforced by the weight of the body. Flakes are thus removed from the under side, and the folded buckskin pad serves to prevent breakage of the blade under treatment.

John Smith of the Jamestown Colony, about 1608, says, speaking of a Powhatan hunter, that "his arrowhead he quickly maketh with a little bone which he ever weareth at his brasert (belt)."

The shaping processes here illustrated were formerly in general use among the tribes. The women doubtless aided in the work of transportation and in preparing food for the quarrymen. The costumes shown are modeled after the garments of the Virginia Indians at the period of discovery, as illustrated in the drawings of John White, artist of the Roanoke Colony.

That the quarries of the region were worked by the Powhatans and adjacent tribes is amply proved by the discovery on their deserted village sites and in their shell heaps throughout the Potomac-Chesapeake region of countless numbers of implements identical with those produced in the local quarries.

This group was designed by W. H. Holmes, Head Curator of Anthropology; the figures were modeled by U. S. J. Dunbar, sculptor, and the whole was installed by H. W. Hendley, ethnological preparator, in 1911.

Post. Jan 15, 1915

TREASURES FROM THE FAIR.

Plaster Casts and Totem Poles Received at the National Museum.

For the past several days the National Museum and Smithsonian Institution have been receiving huge boxes, barrels, and cases containing the material exhibited at the exposition at St. Louis, together with a large number of castings and reproductions of some of the famous material of the Berlin, Paris, and British museums, which had been sent to St. Louis.

Through the enterprise of Prof. W. H. Holmes, chief of the Bureau of Ethnology, the National Museum secured some exceedingly valuable anthropological material sent to the exposition from various parts of the globe, notably from Alaska. The greatest prize thus secured were two enormous, carved totem poles, thirty-five and forty feet in height respectively. These two poles, carved from Alaskan cedar, were once the chief pride of an Alaskan village, and were one of the sights of the exposition. They arrived early last week loaded on a flat car, and were set up in the west hall of the museum, among the Alaskan and Eskimo collections. They had to be introduced through one of the windows, and were found to be too high, by several feet, to stand upright in the building. A cross cut saw was accordingly produced, and for a time the place looked like a house-raising and log-rolling, the members of the corps of laborers taking turns at sawing off the uncarved butts of the two poles in order that they might stand upright. Inasmuch as the poles are about three and one-half feet thick at the base, this proved to be no easy task.

The casts which Prof. Holmes obtained at St. Louis of masterpieces from some of the great European museums consist of Greek statuary, Assyrian and Babylonian bas reliefs, and curious stone idols obtained many years ago in Mexico and Central and South America by famous German explorers.

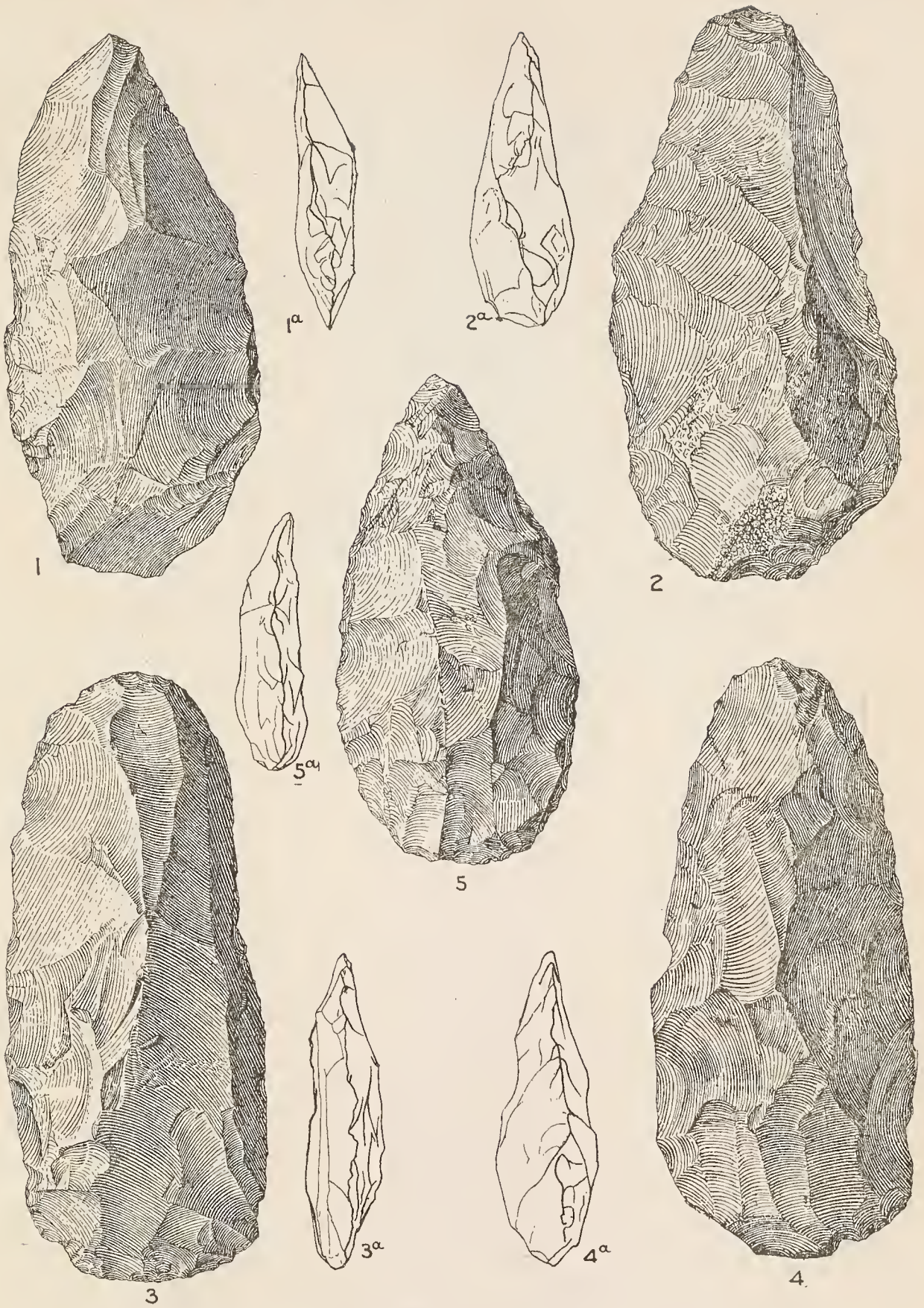
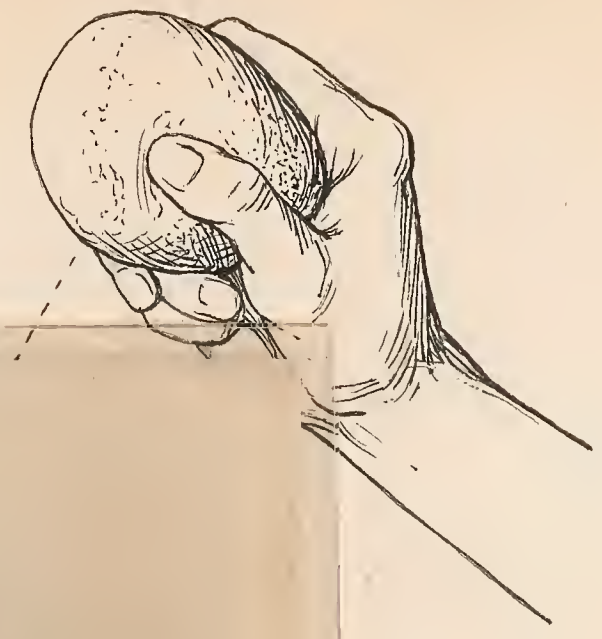


Plate illustrating the Newcomerstown "paleolith," copied with all possible care from the cut in "Man and the Glacial Period," and four ordinary rejects of the blade-maker, the latter obtained in three cases from modern flint shops in the same region, and in the fourth case directly traceable to the same shops. The separation of the "implement" of glacial age and paleolithic type from the modern rejects is left to the reader. Three-fourths actual size; the profiles on a still smaller scale.

17. Failures in Blade Making, Compared with Supposed Paleoliths.

This specimen is from
an other specimen in the set.

18. Rejects of blade making, showing the cause of the great quantities of rejectage. The aim of the workman was to obtain a thin blade such as were used as knives and projectile points, but too great thickness on one or both sides of the prospective blade, a result of the failure of the flakes to carry across the full width, left a hump which no skill could remove. Hence the rejectage



19. Chipping by Percussion.

Changed from first to second floors
And set up by ignorant persons without
consulting me The ground should be covered
by fresh clippings to not by soaked every
pebbles

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19. Chipping by Percussion.

20. Chipping by Pressure

21. Two Forms of the Chipping Work.

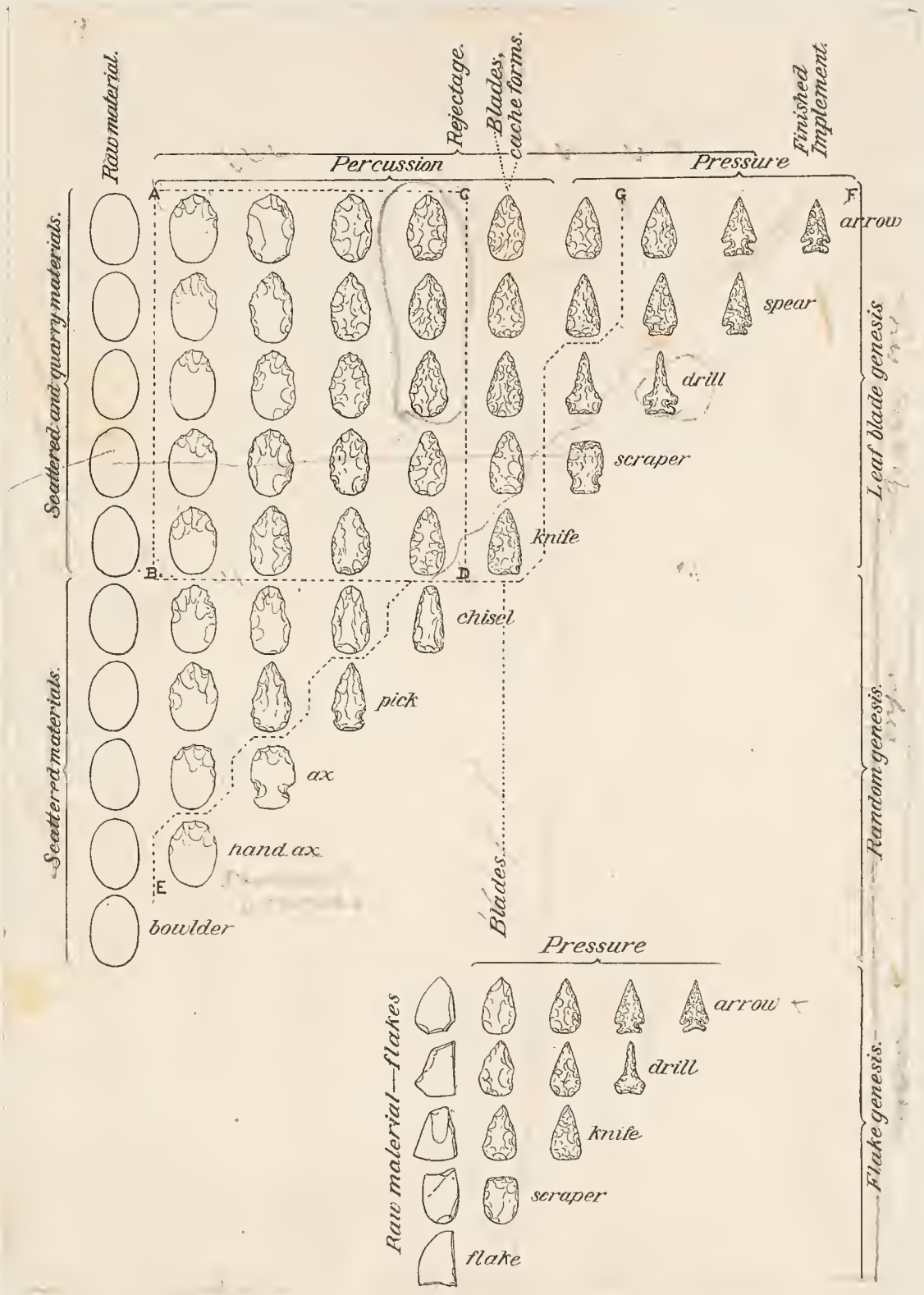

DIAGRAM I.

22. Diagram showing Progress of Bowlder Chipping by Percussion and Pressure.

John Smith, who had an intimate acquaintante with the Indian tribes of the Virginia region, gives a brief but explicit account of the ordinary method of providing arrowheads among the tribes of Virginia: "His arrowhead he quickly maketh with a little bone which he ever weareth at his brasert, of any split of a stone, or glasse in the forme of a heart, and these they glew to the end of their arrowes." a/

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a/ Smith, John - True Travels (1629), Richmond reprint, 1819, Vol. I, p. 132 (Smith's voyage, 1606).

Sellers, referring to observations made by Titian R. Peale, who accompanied Lewis and Clark on their exploration to the Pacific, contributes the following:

"Mr. Peale said he had seen sqaws chipping flakes into small arrow-points, holding the flake in their left hand, grasped between a piece of bent leather, and chip

off small flakes by pressure, using a small pointed bone in the right hand for that purpose. From this it was evident that John Smith's story was no myth." a/ It is entirely correct.

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a/ Sellers, George Escol - Observations on stone-chipping, Smithsonian Rept. 1885 Pt. 1, pp. 872-3.

A similar process identical with the blade outlining process described by Beckwith, was demonstrated by an aged Washoe Indian for the benefit of Mr. S. L. Lee who described it in a letter addressed to Professor O. T. Mason, dated Carson City, Nevada, 1904. The chipping implements were two points, a large and a small one, made of buckhorn reinforced with a piece of "rabbit brush" and wrapped with buckskin. These articles were later presented to the Museum by Mr. Lee, and are illustrated in Fig. 2. The significance of the "rabbit brush" is not made out.

That stone on account of its hardness and brittleness was unsuited for the manufacture of chipping implements

is entirely apparent but its use, probably in the absence of the better material, is recordéd by a number of writers. Father Morice, the learned student of the western Dene ? furnishes the following account of their work:

"The material chosen in preference to fashion arrow or spear heads with was loose, broken pieces of the rock such as were found on the surface. Of course these were confined to a few localities only, wherein were situated sorts of quarries which were very jealously guarded against any person, even of the same tribe, whose right to share in their contents was not fully established. A violation of this traditional law was often considered a causes belli between the co-clansmen of the trespasser and those of the proprietors of the quarry.

"The first operation consisted in roughly blocking off with a hard stone the pieces of the flint, the removal of which was necessary to obtain a vague resemblance to

intended weapon. Then grasping the flint length-wise with the closed fingers of the left hand (fig. 44), the arrow-smith carefully pressed off the flakes with an elongated stone held in his right hand, until the desired form and finish were obtained. A piece of buckskin served as a pad to protect the hand against the asperities of the point.

"I owe these details to an old chief who has been an eye-witness to the operation. I should add that in not a few cases a moose molar tooth replaced the long chipping stone. I know also of a very few points the sharp edges of which have been polished by friction." a/

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a/ Father Mroce, Trans. Canad. Instn., Toronto, 1894, IV, 65.

The Mexicans are said to have held a piece of obsidian in the left hand and pressed it against the point of a small goat's horn hled in the right, by moving it gently in different directions they chipped off small flakes until the arrow was complete. This is a more variant of the

simple free hand method of pressing the bone implement against the edge of the stone. This work is duplicated according to Balfour in that of the Australians save that the bone is rested on the ground in the latter case and is classed with the rest pressure process (which see).

According to Chever, a free-hand pressure method of chipping of somewhat exceptional character was practiced by certain California tribes:

"The stone arrowheads are made with great care, and the materials from which they are made are often brought from long distances. Obsidian and agate are probably selected not so much for beauty of coloring as for their close grain, which admits of more careful shaping. They use a tool with its working edge shaped like the side of a glazier's diamond. The arrowhead is held in the left hand, while the nick in the side of the tool is used as a nipper to chip off small fragments."[a/] Since it does not

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a/ Chever, Edward, The Indians of California, The American Naturalist, Vol. 14, May, 1870, No. 3, pp. 141-4

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appear that Mr. Chever actually witnessed the use of the nipper described and illustrated by him, it seems possible

that the notch may be nothing more than the shallow groove produced by continued use of the flaker on the sharp edges of the stone worked, yet the process would closely resemble that described by Powers in which a pincer-like tool was used. (Powers?). And again the Cloud River Indians are said to have used a notched implement made of bone or antler resembling the glazier's diamond pointed glass fracturing implement. (Fowke). The Mexicans, according, to one writer are said to have used a notched bone in a similar manner, but according to Fowke, the edge of the stone was set in the notch and the flake was broken off with a sidewise blow. The notch here referred to is probably nothing more than the irregular notch cut in the bone tool by the sharp edge of the stone.

A second distinctive or exceptional method of

free hand pressure shaping practiced by the California Indians is described by Powers:

"It was often a source of wonder to me how the delicate arrow-heads used on war-arrows, with their long, thin points, could be made without breaking them to pieces. The Viard proceed in the following manner: Taking

AKING BY
HEAT.

a piece of jasper, chert, obsidian, or common flint, which breaks sharp-cornered and with a conchoidal fracture, they heat it in the fire and then cool it slowly, which splits it in flakes. The arrow-maker then takes a flake and gives it an a, roximate rough shape by striking it with a kind of hammer. He then slips over his left hand a piece of buckskin, with a hole to fit over the thumb (this buckskin is to prevent the hadd from being wounded), and in his right hand he takes a pair of buck-horn pincers, tied together at the point with a thong. Holding the piece of flint in his left hand he breaks off from the

edge of it a tiny fragment with the pincers by a twisting or wrenching motion (Fig. 10). The piece is often reversed in the hand, so that it may be worked away symmetrically. Arrow-head manufacture is a specialty, just as arrow-making, medicine, and other arts."[a/]

THE MANUFACTURE OF STONE IMPLEMENTS BY THE AMERICAN ABORIGINES.

THE INDIAN tribes of the New World had not advanced beyond the "stone age" of culture, and the quarrying and shaping of stone implements were to them industries of vital importance. Suitable stone was gathered from the surface of the ground or was obtained at the expense of great labor from the deposits in place. The quarrying of flint and other bedded minerals was carried on in many sections of the country, and the pittings may still be seen among the hills. In like manner, water-worn stones—bowlders and pebbles—were quarried from the river bluffs and ancient beaches, and extensive workings of this class are found in the suburbs of Washington City.

This group is intended to illustrate the work carried on in the great quarries on Piney Branch and in the associated workshops not long before the arrival of the English, some three hundred years ago, near the point where Eighteenth street would cross that stream. The broken bowlders and flakage left on the shop-sites are in places ten feet or more in depth.

The man at the left is represented as employing a heavy, wooden pike in prying up the larger bowlders, while the second breaks them up preparatory to selecting fragments of suitable size and shape for implement-making.

The third man roughs out the forms of the implements by means of quick, sharp blows with a bowlder-hammer, using either the selected fragments or the smaller bowlders for the purpose.

The fourth workman trims the edges and shapes up the thin blades with an implement of bone or antler set in a wooden shaft. The flaking is accomplished by setting the point of this implement against the edge of the roughed-out blade, and pressing it downward with a quick, strong movement, reenforced by the weight of the body. Flakes are thus removed from the under side, and the folded buckskin pad serves to prevent breakage of the blade under treatment. This work, however, was not completed at the quarry, the blades being usually carried away to be finished as the implements were needed.

The finishing touches are given, as indicated by the fifth workman, who chips out the notches and shapes the points by means of a small flaker of bone or like material, which is pressed down on the sharp edge of the blade until it "takes hold." Then, by a quick push, the flake is driven off. John Smith, of the Jamestown Colony, about 1608, says, speaking of a Powhatan hunter, that "His arrow-head he quickly maketh with a little bone which he ever weareth at his brasert" (belt).[225]

The shaping processes here illustrated were formerly in general use among the tribes. The women doubtless aided in the work of transportation and in preparing food for the quarrymen. The costumes shown are modeled after the garments of the Virginia Indians at the period of discovery, as illustrated in the drawings of John White, artist of the Roanoke Colony.

That the quarries of the region were worked by the Powhatans and adjacent tribes, is amply proved by the discovery, on their deserted village sites and in their shell heaps throughout the Potomac-Chesapeake region, of countless numbers of implements identical with those produced in the local quarries.

Group designed by W. H. HOLMES; figures modeled by U. S. J. DUNBAR; installed by H. W. HENDLEY, 1911.

Museum Group showing the workers, modeled in clay and cast in plaster by U. S. J. Dunbar after designs by W. H. Holmes. On a recent occasion, 1925, Col. Sherrell, D. C. Engineer, visited the quarry site with Mr. Holmes and was very much impressed by the suggestion that these three figures should be cast in bronze and set up on the quarry slope as a monument to the aboriginal owners of the quarry - owners indeed of the entire land, serving at the same time as a historical monument and a park embellishment.

structions were to get back as fast as possible to Mut, refill the tanks, and to beg, borrow or steal all the tanks and waterskins he could get hold of in the oasis, and to bring them all back filled with water. Having seen them off from the depot on the way back to Mut, I set out with Abd er Rahman to follow up Qway's tracks and to relieve Abdulla.

Abd er Rahman was an excellent tracker. There had been no wind to speak of since Qway had left the depot, and the footprints on the sandy soil were as sharp and distinct as when they were first made.

We followed his footprints for three days and there was mighty little Abdulla looked back and saw Qway hauling the tanks about, which struck him at the time as a rather unnecessary performance: but as Qway explained, when he overtook him, that he had only been rearranging the depot and placing the sacks of barley so as more effectually to shade the tanks, his suspicions had been lulled.

For most of the first day after leaving Qway Abdulla kept turning things very slowly over in his "feeble head," and, toward the end of the second day, it began to occur to him that Qway's long delay in the depot was rather suspicious: so before proceeding any farther along his route, he thought it advisable to ride across and

Much as he hated the overbearing Arab, he had worked with him for two seasons, and, as he had said, there is a bond of union between those who "know the nijem."

"He will die," declared Abd er Rahman. "It is certain he will die. He had only five days' water, and it is four days since he left the depot. He is not going where the water is, but he is making for the 'Valley of the Rat.' It is certain he will die of thirst. His camel has had no water for four days."

We followed Qway's footprints for a short distance. But he had been traveling very fast, and it was obvious that we should never catch him up. He

what he told me."

Then, hearing a snort from Dahab, he added that there was not only one afrit, but many, and that that part of the desert was full of them. I thought it time to stop him. I told him I had heard quite enough, and that he had to come around with me to the merkaz.

* * * *

WE met the mamur at the door of the merkaz, and Qway immediately rushed forward to try and kiss his hand. The mamur, however, would have nothing to do with him. Like nearly all the felahin, he backed the winner, and I for the moment had come out on top.

"This man is a traitor, a regular traitor," said the judge, who had not yet tried him and who had previously told me he was a sportsman. But I had got the best of the deal, and, moreover, was shortly returning to Egypt and might report on him to one of the inspectors. So he determined to show me how an Egyptian official can do justice when he takes off his coat for the job.

He bustled in to the office and began arranging papers fussily on his table. Having got things to his satisfaction, the mamur ordered the prisoner to be brought in. He arrived between two wooden-looking policeman.

"Well, traitor, what have you got to say for yourself? Mr. Harden Keen says you upset some water. What do you say to it?"

"Yes, I upset the water. But I could not help it. It was a very hot day. . . ."

"Liar!" said the mamur.

"Na'am?" said Qway, rather taken aback.

"I said liar," shouted the mamur, thumping the table. Qway, who was a high-spirited fellow, found this more than he could stand, and began to get nettled.

"As I said, Effendim, it was a hot day—very hot, and I am an old man and perhaps it was the sun. I don't know what it was, but an afrit——"

Indians Had Implement Shops Here, Smithsonian Scientist Discovers

Suggestion That Site at Piney Branch Be Preserved as a Park Has Support of Many Persons Who Are Interested in Archeology.

MAN'S antiquity on the American continent has been a subject for scientific investigation and for fascinating speculation ever since the discovery of the New World by Columbus. With the constant unearthing of new evidence of the presence of ancient man, each generation has contributed some of its best scientific minds to the deciphering of the story hidden in these relics. The question has been raised anew by each new discovery of human bones under circumstances which indicate real antiquity, such as the various discoveries of apparently ancient human skeletal remains in Florida, certain of which are now being investigated under Smithsonian auspices.

In many respects the problem is as far from solution today as it was 400 years ago. Facts upon which to base a scientific solution are still lacking. Yet some theories or assumptions heretofore held by scientists in this country and abroad have been disproved and the subject has been cleared of hasty speculation within recent decades. In this work the Smithsonian Institution has played a leading part.

It is a remarkable coincidence that within the limits of Washington, the Capital City of the great Nation of the race which deprived the American aborigines of their birthright and succeeded them in possession of the Northern Hemisphere, has been found the site of one of the most important workshops east of the Mississippi River, where these early Americans manufactured their implements of war and the chase. It is an interesting fact that Dr. William Henry Holmes of the Smithsonian Institution, by his excavations on this site, contributed knowledge that revolutionized scientific thought on this important question and placed American archeology on a new foundation.

* * * *

WITHIN 2 1-3 miles of the White House, this spot, in the secluded little valley of Piney Branch, west of Sixteenth street, has long been unmarked and is today in danger of complete obliteration by modern building operations. At last, however, a definite movement is gaining headway, backed by Smithsonian scientists and the Federal Office of Public Buildings and Public Parks of the National Capital, to preserve it as a public park and mark the spot with a suitable bronze group showing the ancient quarrymen and implement-makers at work.

"The Piney Branch site is not only of great interest historically," says Dr. Holmes, "but is scientifically one of the most interesting spots in America. When, 40 years ago, I began the study of the ancient remains of the Eastern States, the archeologists of Washington, New York, Boston and other cities were gathering rudely chipped stones such as are found on the slopes of Piney Branch. They filled museum cases with them and labeled them 'American Paleolithic Implements.'

DIGGING INDIAN RELICS FROM THE PINEY BRANCH QUARRY.

PLASTER GROUP ILLUSTRATING WORK IN A QUARRY SHOP.

The archeologists of the world accepted without hesitation the view that these chipped stones were the implements of a race preceding the Indian, a race of glacial age, that in the scale of culture had never risen above the use of rude stone tools.

"One day it struck me as an important fact that none of these so-called implements showed any signs of having been used. I examined them closely and visited the Piney Branch region and soon reached the conclusion that the existing ideas were all wrong—that these chipped stones were not implements of a race that had lived here perhaps 40,00 or 50,000 years ago. They were, in fact, not implements at all, but the rejectage of the difficult chipping process, the failures of the Indian blade maker, left on the quarry sites as simple refuse. The successful blades—not one in 20 attempts—were carried to the villages and finished to serve as weapons of war and the chase and in the various primitive arts.

"For a score of years controversy over this interpretation raged, but there is today, so far as I know, not in any museum in the world a single American shaped stone of any kind labeled as belonging to the glacial period or to a stone age of culture corresponding with that of the Old World.

"Investigations carried on in Piney Branch thus resulted in settling one of the most important questions involved in the aboriginal history of America. For cogent reasons, both historical and scientific, this site, in the city of Washington, should, with its forested slopes and beds of chipped stones, be preserved and marked. Such a memorial would have a unique interest today, and an interest that would grow as the centuries pass."

Dr. Holmes modestly refrained from saying that his investigations and interpretations of the material he found as the result of his excavations in the Piney Branch Valley raised him to a foremost position among American archeologists. He has now passed his eightieth milestone in life, his birth having occurred the same year that the Smithsonian Institution was founded. His mind is as active as ever, and he is absorbed with many studies, but the preservation for future generations of Americans of the Piney Branch site he regards as of great importance and it lies close to his heart.

* * * *

MOST of the important facts relating to the Piney Branch site were explained to Lieut. Col. Clarence Sherrill shortly before he resigned as director of public buildings and public parks in Washington, and he approved the project. Maj. U. S. Grant, grandson of the great Civil War general and President of the United States, who has succeeded Col. Sherrill, hopes to go forward with the plan to buy the land and make a park along Piney Branch.

Preliminary surveys have been made and some small portions of land have been acquired. Only lack of funds prevents the completion of the project. Maj. Grant looks forward to the time when Congress will make the money available for the preservation of this whole site, which is of so much interest to American historians and scientists throughout the world, before it is obliterated by the rapidly encroaching suburban building operations.

Not long before Col. Sherrill left Washington he went over the ground with Dr. Holmes, and together they selected a place for the erection of the proposed group of statuary as a memorial to the aboriginal implement makers whose race was driven from its ancient home by the white race which now occupies the land and has built its great Capital City where the Indians once busily carried on industry and trade.

"I have been especially interested in the development of the northwestern suburbs of Washington," wrote Dr. Holmes to Col. Sherrill, "and my recent visit with you to Piney Branch has aroused anew the hope that this secluded little valley may yet be rescued, at least in large part, from the ruthless invasion of suburban improvement.

"This valley, as you know, deserves the city's attention, not only on account of its romantic beauty and desirability as a park area, but especially for the reason that it bears on its forest-covered slopes one of the most important historical sites east of the Allegheny Mountains—the site on which for hundreds, possibly thousands, of years the Indian tribes of the Potomac Valley quarried quartzite bowlders from which they roughed out by fracture their implements of war and the chase. The numerous tribal groups dwelt in the villages scattered along the banks of the Potomac and its tributaries. Unmolested, they fished in the beautiful streams and hunted in the primeval forests. They had no forebodings of the fate that awaited them—the complete surrender to foreign and merciless invaders of the birthright of their race.

"The first white man arrived in 1620 and the last Indian disappeared from the valley in 1690. Since that date barely ten generations have passed, yet today the only permanent mark of their presence here, the only existing reminder that such a people ever dwelt within the District of Columbia are these deposits of quarry-shop refuse covering acres of ground, on the site of which will in a few years be the very center of the Capital City of the usurping race.

"A most serious question thus presents itself to our people. Shall we go on selling and buying and selling again the hills and valleys of their birthright, amassing fortunes upon fortunes, without a thought of their former existence or their sacrifice? In the world's history races have succeeded races in the possession of the garden spots of the world, and are we to follow the example of the barbarians of the past? Or shall we preserve this Piney Branch site, erecting thereon a monument, a memorial, to show the world that we are not utter ingrates?"

ILLUSTRATING THE QUARRY FORMATION.

* * * *

FOR nearly half a century Dr. Holmes has been associated with the Smithsonian Institution in many different lines of scientific endeavor

(Continued on Fourth Page.)

QUARRY GROUP IN PLASTER ON THE PINEY BRANCH SITE.

San Antonio, Texas,

Dec.10th, 1892.

W.H.Holmes, Esq.

My dear Holmes,

I have just been reading your article in "Science" of Nov.25th, on Modern Quarry refuse and the Paleolithic Theory. It strikes me as about the most level headed article in the anthropologic "nacket" I have seen for many a year. Your simple statement of the facts is such as to carry conviction with it by sheer force of good sense and to resist it looks like "biting a file". I wonder I never thought of that view of the situation before. We always do wonder when a simple sensible explanation comes forward to take the place of a complex overloaded hypothesis and no better evidence is wanted of the strength ~~by~~ of a hypothesis than its perfect simplicity and naturalness.

And this reminds me that during the summer of '86 I was in Oregon on the western flank of the main mass of the "Three Sisters" high up. A little above was a large moving glacier. At the point I have in mind there was an old flow of obsidian very glassy and brilliant in fracture and containing in spots a great abundance of those lithophysae which Hague and Iddings have described from Yellowstone Park. I remember being very much puzzled at the time by seeing enormous quantities of sharp-edged flakes - piled up in

long "windrows" so to speak and at once exclaimed to myself "what a jolly place for the primitive man". But how the deuce they got there was a mystery - a regular "corker". To suppose that they had cracked off in some natural process of disintegration would have been a gratuitous assumption and contrary to all experience. Human agency suggested itself but was dismissed on account of the vast abundance of the flakes. That this might have been a workshop patronised for many generations did not occur to me. But I now think that is a satisfactory solution of it. I saw no wrought implements - nothing but sharp flakes spalled or chipped off apparently, though if I had searched I might perhaps have found some partially shaped pieces spoilt when partly worked and then thrown away. U suspect that you would add this place to your list of workshops if you could see it. Keep the ball a-rolling my dear fellow; you have made a good strike here and I rejoice to see it.

Very truly yours,

(signed) C.E.Dutton.

Major, U.S.A., and a member of the Staff of the U.S. Geological Survey, with whom I spent the summer of 1880 in the survey of the Grand Canyon of the Colorado. See reports for that year and the great Atlas that I helped to develope.

"The late eminent glacialist, Dr. Carvill Lewis, considered them rather modern, and also maintained that what Dr. Abbott believed to be undisturbed layers, were those of an ancient talus. These statements Dr. Lewis made at an open meeting of the Academy of Natural Sciences, Philadelphia, not long before his regretted death, concerning specimens from Dr. Abbott which I then laid before the Academy. It is the opinion of most glacialists that the Trenton-gravel finds require further study before we can assign their probable age. I have myself found these chipped stones in the Trenton talus, but never in clearly undisturbed strata." good

D.G.Brinton <u>in</u> Science, October 28, 1892. p. 249.

BUREAU OF AMERICAN ETHNOLOGY
15th Annual Report, 1893-94.

"Specially noteworthy among the results of the archeologic work in the Bureau during the current year are the monographs by Professor Holmes on "Ancient Pottery of Eastern United States" and "Stone Art of Eastern United States." Both embrace the results of researches extending over many years; both are elaborately illustrated from material preserved in the National Museum; both represent the mature conclusions of an able and carefully trained archeologist. The classification and interpretation adopted by Professor Holmes are primarily indigenous, though his comparative studies have extended over the archeologic literature of the world, and it is believed that his conclusions will form a firm basis for those branches of archeology to which his work relates. To him science is indebted for a consistent method of interpreting primitive art products through study of the arts of primitive peoples cognate to those whose relics have come down to us from prehistoric times. It was with great regret that the Director accepted his resignation toward the end of the fiscal year, in order that he might transfer his labors to the Field Columbian Museum." (Page LXXVIII)

INDIAN IMPLEMENTS.

Prof. Holmes Explodes Some Theories Heretofore Held.

Near the Piney branch, about one and one-quarter miles from Fourteenth street and Boundary, there has recently been discovered a remarkable quarry workshop, where the Indians at a period not very remote made their stone implements.

During the past four or five weeks Prof. W. W. Holmes, of the geological survey, has made extensive excavations to the depth of about eleven feet and fifty or more feet in length.

Last Tuesday night Prof. Holmes gave to the Anthropological Society a full and very interesting as well as important account of his investigations.

According to the theories hitherto held by scientific men throughout the world, and which they had formed from surface finds, the stone implements in their unfinished state show the gradual progress from the rudest form of instrument, the "turtle back," to the "double turtle back," and so on up to the spear and arrow head and knives.

It is supposed that the Indians who made and used the "turtle back" instruments possessed a very low order of intelligence, and that their advancement in culture was indicated by the perfection of the instrument used.

Prof. Holmes completely demolished this theory last Tuesday night. He finds in the same heap "turtle backs" and "double turtle backs," with broken instruments of higher finish, all mixed with the chips and refuse, showing plainly that they were not regarded by the Indians as instruments at all, but were thrown away as worthless, and the professor asked why scientific men who are seeking after truth should cling to the "turtle back" and "double turtle back" theory, when it was plain that the Indian never used them as instruments, but regarded them as being of no value. The professor gave a very interesting illustration of the manner in which the "turtle back" and "double turtle back" were formed by taking two oblong stones worn smooth by action of the water and knocking one against the other, skillfully turning them in one hand. The first, the "turtle back," was quickly finished by chipping from one side, leaving the other side of the stone entirely smooth.

Again he formed the "double turtle back" by chipping in the same manner from the other side.

He then illustrated the third and last stage by chipping from all sides and shaping it as desired. If the desired shape was obtained without breaking, the instrument appears to have been further perfected by pressure.

The illustrations so skillfully made by Prof. Holmes elicited much applause.

The effort to have Piney Branch added to the Park area

COPY

April 6, 1925.

My dear Colonel Sherrill:

I happened to see in yesterday's paper a note to the effect that you regard the Piney Branch Valley so far desecrated by building and grading enterprises as to be beyond utilization as a part of the part system.

Possibly you are not aware of the fact that Piney Branch was the resort of Indian tribes and that the ancient quarries there are among the most interesting evidences of occupations by Indian tribes east of the mountains.

To me this old quarry in the centre of the capital city of the nation is a sacred spot. My discoveries there have done more to clear up the story of man in America than any single piece of research within the United States. I beg therefore to suggest that some day when spring opens you will let me join you on a visit to this site which has not yet been touched by the ruthless invaders.

Sincerely yours,

Director.

Lieut.-Colonel Clarence Sherrill,
Rock Creek & Potomac Parkway Commission,
1839 California Street,
Washington, D. C.

Colonel Mitchell

C O P Y

NATIONAL CAPITAL PARK COMMISSION

NAVY BUILDING

Washington

May 1, 1925.

Dr. W. H. Holmes,
National Gallery of Art,
Smithsonian Institution,
Washington, D. C.

My dear Dr. Holmes:

Receipt is acknowledged of your interesting letter of April 29th, for which I am duly appreciative. It will be of great value to our purpose to have your strong backing for the procurement of these Indian Quarries and I am sending a copy of your letter to each member of the Commission for their information.

I am in entire sympathy with your proposition to install a bronze monument of an Indian on the site of these mounds as a permanent record of the early occupation of this land and if it should be acquired I will present this matter to Congress immediately for its consideration.

Yours very cordially,

(Signed) C. O. SHERRILL

Member and Executive Secretary.

In 1930 Colonel Grant succeeded Sherrill has taken up the monument idea

C O P Y

April 29, 1925.

My dear Colonel Sherrill:

A resident of Washington for more than half a century, I find it most gratifying to learn that at last we have assurance of a real awakening to the vital needs of our city as the capital of the nation. Coupled with this assurance of awakening are the two great essentials,--the requisite genius for the development of plans and the dynamic force that assures their realization.

I have been especially interested in the development of the northwestern suburbs of the city, and my recent visit with you to Piney Branch has aroused anew the hope that this secluded little valley may yet be rescued, at least in large part, from the ruthless invasion of suburban improvement. This valley, as you know, deserves the city's attention not only on account of its romantic beauty and desirability as a park area, but especially for the reason that it bears on its forest covered slopes one of the most important historical sites east of the Allegheny Mountains,--the site on which for hundreds, possibly thousands of years the Indian tribes of the Potomac Valley quarried quartzite boulders from which they roughed out by fracture their implements of war and the chase. The numerous tribal

groups dwelt in villages scattered along the banks of the Potomac and its tributaries. Unmolested, they fished in the beautiful streams and hunted in the primeval forests. They had not forebodings of the fate that awaited them -- the complete surrender to foreign and merciless invaders of the birthright of their race.

The first white man arrived in 1620, and the last Indian disappeared from the Valley in 1690. Since that date barely ten generations have passed, yet today the only permanent mark of their presence here, the only existing reminder that such a people ever dwelt within the District of Columbia, are these deposits of quarry-shop refuse covering acres of ground, on the site which will in a few years be the very center of the capital city of the usurping race.

A most serious question thus presents itself to our people: shall we go on selling and buying and selling again the hills and valleys of their birthright, amassing fortunes upon fortunes, without a thought of their former existence or their sacrifice? In the world's history races have succeeded races in possession of the garden spots of the world, and are we to follow the example of the barbarians of the past? Are we the barbarians of the present? Or shall we preserve this Piney Branch sits, erecting thereon a monument, a memorial, to show the world that we are nŏt utter ingrates?

But who shall take up the task thus suggested? Shall it be the Smithsonian, the Carnegie Institution or the Archeological Society of Washington? They can do so if they wish, but it is not their responsibility. Should appeal be made to the women of the city or of the country who have hearts of mercy and generous sympathy with the wronged of all lands? Should the city of Washington, the immediate beneficiary of the red man's sacrifice be called upon to recognize the debt? Or should we not expect that the national Government, which has built its splendid Capitol on the spot that should be sacred to the plundered race, will take effective steps to preserve the spot and erect upon it a tribute acknowledging the debt which it can never pay?

The Piney Branch site is not only of great interest historically, but is scientifically one of the most interesting spots in America. When, forty years ago, I began the study of the ancient remains of the eastern states, the archeologists of Washington, New York, Boston and other cities were gathering rudely chipped stones such as are found on the slopes of Piney Branch. They filled museum cases with them and labelled them "American Paleolithic Implements," and the archeologists of the world accepted without hesitation the view that these chipped stones were the implements of a race preceding the Indian,

a race of glacial age, that, in the scale of culture had never risen above the use of rude stone tools. I examined carefully these specimens and visited the Piney Branch sites and soon reached the conclusion that this was all wrong, and that these chipped stones were not implements at all, but rejectage of the difficult chipping process, the failures of the Indian blade maker, left on the quarry sites as simple refuse. The successful blades, not one in twenty attempts, were carried to the villages and finished to serve as weapons of war and the chase, and in the various primitive arts. For a score of years controversy over this interpretation raged, but there is today, so far as I know, not in any museum of the world, a single American shaped stone of any kind labelled as belonging to the glacial period or to a stone age culture corresponding with that of the Old World.

Investigations carried on in Piney Branch thus resulted in settling one of the most important questions involved in the aboriginal history of America. For cogent reasons, both historical and scientific, this site, in the midst of the city of Washington, should, with its forested slopes and beds of chipped stones, be preserved and marked. Such a memorial would have a unique interest today and an interest that would grow as the centuries and the millenniums pass.

I trust that gratifying success may crown your every effort in the great enterprises in which you are now engaged.

Very truly yours,

Director.

Lieut.-Colonel Clarence Sherrill,
1839 California Street,
Washington, D. C.

ESS ALL COMMUNICATIONS TO
THE DIRECTOR

OFFICE OF
PUBLIC BUILDINGS AND PUBLIC PARKS
OF THE NATIONAL CAPITAL

18th B street
M 25-20

ER TO_____

April 8, 1925.

Mr. W. H. Holmes,
Director, National Gallery of Art,
Smithsonian Institution,
Washington, D. C.

Sir:

Referring to your letter of April 6, 1925, the remark to which you refer has reference to the portion of Piney Branch Valley east of 16th Street which has largly been destroyed by debris, but which I still hope will be possible as a park.

Sometime at your convenience, if you will call at my office, I will go out with you to look it over.

Very truly yours,

C. C. Glover
Director.

NATIONAL CAPITAL PARK COMMISSION
NAVY BUILDING
WASHINGTON

May 11, 1925.

Dr. W. A. Holmes,
National Gallery of Art,
Smithsonian Institution,
Washington, D. C.

My dear Dr. Holmes:

Receipt is acknowledged of your interesting letter of April 29th, for which I am duly appreciative. It will be of great value to our purpose to have your strong backing for the procurement of these Indian Quarries and I am sending a copy of your letter to each member of the Commission for their information.

I am in entire sympathy with your proposition to install a bronze monument of an Indian on the site of these mounds as a permanent record of the early occupation of this land and if it should be acquired I will present this matter to Congress immediately for its consideration.

Yours very cordially,

C. O. Sherrill
Member and Executive Secretary.

(66)

Star, May 6, 1928.

CITY WILL SEIZE PINEY BRANCH LAND

Price Asked Prohibitive, Condemnation Suit Is Begun by Order of Col. Sherrill.

Immediate steps will be taken to condemn land considered necessary for the park system of the National Capital. Lieut. Col. Clarence O. Sherrill, director of the office of public buildings and public parks of the National Capital and executive officer of the National Capital Park Commission, today sent a letter to the Attorney General of the United States asking him to immediately institute proceedings to condemn three tracts of land in this city. These include what is known as the Piney Branch Parkway, extending in a northeasterly direction from the Tiger Bridge on Sixteenth street to Fourteenth and Varnum streets, following the line of Piney Branch, which is now inclosed in a pipe; the large tract of land east of Connecticut avenue and north of Klingle valley road in the Cleveland Park section and the triangle at Thirty-seventh street and Wisconsin avenue.

Will Halt Dumping.

The purpose of this move, according to Col. Sherrill, is to prevent any further destruction of these lands for park uses. Institution of the proceedings will have the immediate effect of stopping further dumping on the grounds. Considerable dumping of earth has been going on for some time in the Piney Branch Parkway, and if it were allowed to continue the site would be destroyed.

It is the purpose of the Park Commission to purchase this plot to provide a driveway by way of Rock Creek Park to the downtown section without the necessity of getting into the heavy traffic in the highways of the city proper.

Negotiations have been conducted for some time by the Park Commission in an effort to purchase these lands at a reasonable figure, but it has been found impossible to get them on this basis. Therefore, it was decided to take the land for Government use by condemnation.

PINEY BRANCH LOST FOR PARK PURPOSES

Beauty So Marred by Dumps That It Cannot Be Used, Sherrill Says.

Piney Branch Park, long sought as a part of the park system of the District of Columbia, has so far been destroyed for park purposes by the marring of its natural beauties by the dumping incident to the advance of building that it never may be purchased. This section of parkway follows the valley of the old Piney Branch, now piped, running between Fourteenth and Varnum streets, at its junction with the present Tuberculosis Hospital grounds, to the east side of the so-called Tiger Bridge on Sixteenth street.

Consistent efforts were made to have the present owners to desist from the dumping there and preserve the tract until legislation could be put through Congress to provide for its purchase. But great trucks dump yellow clay and debris dally down the slopes, destroying its beauties for all time. The provision for the purchase of this tract was carried in a bill which was up in Congress many times. The same measure always carried the authorization for the purchase of the Klingle Valley tract in Cleveland Park and the Patterson tract on Florida avenue, adjoining the Columbia Institution for the Deaf.

Have Power to Buy.

However, the National Capital Park Commission has the authority to purchase such tracts without specific authority from Congress. In fact, one of the first acts of the commission was a purchase of the Klingle Ford tract, which was taken over by the Government as a part of the park system several weeks ago.

The Government owns the ground up to the east side of the Tiger Bridge, and efforts were made to have the other side purchased before the filling was continued up to the bridge. Local civic bodies made many valiant fights to save this property for the park system. Establishment of this parkway would have made it possible for traffic to come downtown through a beautiful drive without having to be impeded by the cross-traffic on the city streets proper.

Lieut. Col. Clarence O. Sherrill, director of public buildings and public parks of the National Capital, and executive officer of the national park commission, said today that the destruction of the parkway seemed to have gone so far that it would be practically useless for the purposes for which it was intended, and that it was probable that it would never be purchased.

The final decision, if it should be not to purchase, would be a source of much regret, it is shown, to the people of the District of Columbia. But, it was pointed out, its natural beauties are so far destroyed that it would be rather expensive to attempt to restore it. Only a narraw gorge now remains down the valley, flanked on either side by ugly clay banks, and in some cases the tree trunks are covered for a portion of their height.

Herald - June 11, 1928

CONDEMNATION SUITS PLANNED FOR PARKWAY

Department of Justice Will Take Steps to Conserve Tract Following Protests by Citizens Associations

Condemnation of enough land in the Piney Branch tract in uptown Washington to save the transcity parkway through the valley from threatened destruction is expected to begin today.

Suits are scheduled to be filed in the District branch of the District Supreme Court by the Department of Justice. Assistant Solicitor George P. Barse is in charge of the condemnation proceedings.

FILLED IN BY BUILDERS.

The area involved lies between Fourteenth and Sixteenth streets at Shepherd street and Arkansas avenue. Builders in this section persisted in filling the valley in this section over the combined protests of the Piney Branch, Columbia Heights and Mt. Pleasant Citizens associations.

Two weeks ago The Washington Herald made public the protests of citizens against spoilation of the valley. Dumping operations ceased immediately thereafter and have not since been resumed.

BOULEVARD PLANNED.

The National Capital Park Commission has designated Piney Branch valley as an integral part of the city's park system. It is the plan to run a park boulevard up the valley which will ultimately connect with the Soldiers Home grounds.

With such a boulevard, 65,000 citizens will be able to reach downtown Washington through the Piney Branch and Rock Creek parkways without crossing a single intersecting street, it is pointed out.

Star, May 6, 1928

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Negotiations have been conducted for some time by the Park Commission in an effort to purchase these lands at a reasonable figure, but it has been found impossible to get them on this basis. Therefore, it was decided to take the land for Government use by condemnation.

1892 - 1893

I remained in charge of the archeological field work of the Bureau of Ethnology with Fowke, Mindeleff and Dinwiddie as assistants, personally making important studies in several states. I examined in detail the novaculite quarries of Arkansas, thé pipestone-quarries of Minnesota, and the Ancient copper mines of Isle Royale, Michigan. I also made important studies at various points in the valleys of the Potomac, Genesee, and Ohio rivers, and my surveys and examinations in Delaware Valley, particularly about Trenton, were extended and important. At the last-named locality advantage was taken of the excavation of a broad and deep trench, designed for railway extension parallel with the river front at Trenton, to study carefully the late glacial gravels commonly supposed to yield human relics. For a period of six weeks the excellent exposures made in this trench, 25 to 35 feet deep and miles in length, were constantly watched by me and Dinwiddie, without finding a single artificial object in the previously undisturbed gravels. This negative result is of great importance due to its bearing on the question of the geological antiquity of man.

In December 1892, I was placed in charge of the exhibit of the Bureau of Ethnology for the World's Columbian Exposition at Chicago, and several months were occupied mainly in preparing, classifying, labeling and arranging the

exhibit, which includes (1) a series of collections illustrating aboriginal quarrying, mining, and implement-making industries; (2) various collections of ethnologic material made chiefly by collaborators of the Bureau; and (3) a series of life-size figures illustrating the domestic life, arts and industries of the aborigines. This exhibit proved very attractive to visitors to the Exposition.

At intervals throughout the year I continued researches concerning the development of the shaping arts. Hitherto, American archeologists had in general been content to accept the classification of prehistoric peoples into culture stages based on the products of art work in stone, the classification being based on European studies. The American material throws much new light on the characters of primitive peoples

admits that plants show a life as active, and a sensibility as great as do most animals.[1] Any disturbance of the conditions under which plants thrive are as fatal as the subversion of the relations upon which the lower animals and man himself depend for existence.

In the investigation of this part of our subject, we must remember that we cannot see exhibitions as great as in the more complex forms. Each plant, transitional or not, displays in the struggle for existence and the survival of its kind, a force, an influence almost as great and wonderful as is exhibited by mankind. And though standing above all this, as head and chief, man is too often forgetful of the relation he bears to the innocent weed that is in the pastures bred; too thoughtless, many times, of the vegetable on which he depends for his subsistence and being; too ignorant of the chain which leads from the lowest vegetable form, to the beauty and perfection of his manhood.—[*To be continued.*]

——:o:——

THE DISCOVERY OF "TURTLE-BACK" CELTS IN THE DISTRICT OF COLUMBIA.

BY W. J. HOFFMAN, M.D.

ALTHOUGH the rude stone implements forming the subject of this paper were not found under such circumstances as to assign to them the age that some have suggested, yet the term "turtle-back" is retained for the purpose of distinguishing them from the ordinary modern rude forms, and to illustrate their relationship to some extent to the older and *typical* specimens described and figured by Dr. Abbott.[2] Before giving a description of the implements, the locality of their discovery will be necessary. The surface thus far examined, covers an area of less than two acres in extent, and is situated on the left or south bank of the eastern branch, in Uniontown, D. C., about an eighth of a mile above the bridge connecting that town with Washington city. From the branch southward, the surface gradually rises in elevation, and the region upon which the chief specimens were

[1] Loc. cit.

[2] Am. Nat., x, p. 331; Tenth Ann. Rep. Peabody Mus. Am. Archæol. and Ethnol. II, pt. 1, 1877. pp. 30–43, figs. 1–3; Eleventh Ann. Rep. Mus. Am. Archæol. and Ethnol. II, pt. 2, 1878, pp. 223-257, figs. 1–4.

present Mr. Darwin has investigated the same subject very carefully, and found that when a fly was caught by one of these plants, it would be dissolved in a gastric fluid exactly like that of the animal stomach. Pieces of beef and the like, when subjected to the same process, were acted upon in like manner. Hard mineral substances, like chalk, would, after a time, be rejected by the plant, though seized upon at first like the rest, shall we say as soon as it found out its mistake?[1]

In this country a lady has enlightened us greatly upon this subject by her interesting labors upon the bladder wort (*Utricularia neglecta*). Mrs. Treat has studied the habits of this plant very carefully, and learned that it allures animalcules by means of its bright flowers and leaves glistening with dew. The water bear and other microscopic forms of insect and vegetable life seem to be its food.[2]

Instinct and Reason.—On analyzing the various opinions formed at different times in the world's history, in regard to the reasoning power, or consciousness of action displayed by plants, we shall meet with extremists on both sides of the question. Passing over the mythological accounts of plant metamorphoses, so attractive to the refined Greek and Latin, we only advert to the mental faculties with which the ancients were pleased to endow many plants.

Many in more modern times have lavishly bestowed souls upon plants, as did Adanson, Bonnet, Hedwig and Edward Smith. Martius and Fechner, of Germany, defended these views, and were very liberal in their supply of souls to plants, even regarding them as sentient beings.

Another class, taking the opposite side of the question, among which may be reckoned Hüler, regarded plants as only susceptible to the material influences of the universe. So Descartes made all animals, so far as he could, mere automatons.

The views of naturalists of our own day are more consistent with nature and common sense; that all plants obey as infallible a law as do animals, and are subject to like influences as was observed above. Bichat in his great work on "Life and Death,"

[1] Huxley found in plants something comparable to a nervous system; Darwin something comparable to reflex action.

[2] New York Trib., Feb. 1, 1875; also Darwin's "Insect. Plants," Sir J. Lubbock's "Brit. Wild. Flowers."

found is about fifteen feet above low water mark. This sloping surface consists of fine sand, resting upon a layer of water-worn pebbles of stratified drift. The latter is a continuation of the formation known as the "cobble-stone" drift, upon which the eastern portion of the city of Washington is built. At several localities in that portion of the city, street cuts show exposures varying from five to forty feet in thickness. The several layers of worn and rounded boulders, "cobble-stones," gravel and sand, retain a perfect uniformity of stratification, showing their original deposition and arrangement through the action of water. Upon nearing the Branch we reach the shallow valley worn by that current, and the upper stratum of drift though much lower than farther back in the city, is not low enough to reach the level of that stream even at high tide. Examinations indicate, however, that the upper stratum on the north side of the stream, and the stratified gravel at the locality where the implements occur are the same, their continuity having been destroyed by the body of water just mentioned.

The rude implements were found about one hundred and fifty yards from the edge of the water, associated with quite a variety of more modern manufacture, which, by the way, were, with the exception of two or three examples, all made either of white, vitreous, or nearly transparent quartz. These represent spear-heads, arrow-heads and scrapers of great variety of sizes; some of the latter consisting of split pebbles, nicely finished by chipping, leaving the convex side to retain nearly all of the original surface. Many of the arrow-heads have been manufactured in this way, by cleaving the pebbles and finishing up a few irregularities. The smallest specimens are represented by scrapers, probably used in smoothing down arrows; these are made of tabular pieces of *semi-transparent* quartz, about the size of a five cent nickel, shaped nearly like a horse-shoe, flat at base, and have the opposite convexity nicely beveled.

The next class of implements represent manufacture of a ruder character, and undoubtedly points to greater age; to the earlier and lower state of the art of working stone for pointing weapons. These consist of quartz, and rarely chert, being rudely chipped and flaked, always leaving a greater irregular convexity upon one side of the specimen than upon the other, forming an intermediate grade between the modern forms and those termed "turtle-backs."

The latter is the class to which I desire to call special attention. These lie scattered along various small ravines formed by the rain, mingling with pebbles and modern relics *ad libitum*. They are all made of characteristic yellowish or grayish-brown quartzite, a material used in every instance, which has not been found to occur in a single individual of the two preceding varities. In form they are true "turtle-backs," if the term is admissible. The variety of forms thus far discovered are represented by that undefinable shape usually termed *celts*, and spear-heads.

An examination of a celt gives the following measurements, in inches: length 4.6, width (greatest) 2.4, thickness 1.85. The anterior surface, or that side upon which we find the "turtle-back" elevation, rises to 1.38 above the average line of the cutting edge; while the posterior or opposite side rises to but .47 of an inch beyond the same line. The top of the greater elevation retains part of the natural worn surface of the cobble-stone from which the specimen was wrought, showing the implement to have been manufactured near the locality. The cutting edge though still sharp, is very undulating, owing to the removal of large flakes during manufacture. Secondary chippings, ending in a perfectly continuous edge, shows the relic to have been a complete specimen and not a core, as has been suggested upon the discovery of similar forms. Another reason is, that not a single arrow-head or other specimen has as yet been found, even upon the closest examination, although the flakes would serve to furnish materials for arrow-heads, which could measure, when finished, nearly two inches in length. Considering the nature of quartzite, such utilized flakes should be found, as no disintegration or decomposition could obliterate their form so long as the bodies from which they have been flaked fail to present any changes upon their surface.

The only spear-head found, thus far, presents the same peculiar irregularity, but is especially interesting on account of its great comparative thickness. The specimen is 2.5 inches in length from the projection on the base to the point, 1.8 of an inch broad, and 1.2 thick. The cutting edge is sharp, continuous all around, and slightly undulating, the latter being the result of flaking. Secondary chippings are visible at different points. The anterior lateral cutting edges converge at an angle of 90°, terminating in an extremely delicate and acute point. The "turtle-back" eleva-

tion reaches its extreme elevation less than half an inch back of

In this connection I shall speak of several localities in Pennsylvania, one of which occupies a position in the eastern portion

Hafting processes { Grooves, notches, Perforations, Knobs & Ridges

Perforators used

in ① N. W. C. hammers

② California, Digging weight

③ Pueblo, rings

④ Banner Stones

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tion reaches its extreme elevation less than half an inch back of this, forming an angle of 64° when viewed from either side. Toward the base the descent is more gradual, where there are deeper notches than usually occur, the projections on either side somewhat worn, showing traces of having been used. From all appearance such an implement, as nearly all of this type, appears useless in attempting to penetrate the skin of anything more resisting than that of fishes.

It is very probable that these rude implements were not manufactured and employed by the Indians of historic times who inhabited this region. The question is asked, Why then do these implements occur with more modern ones upon the surface, or in washes? The only reason that can be given is, that the rude forms occupying that portion of the stratum of sand resting upon the gravel, and those of modern manufacture occupying the surface of the later deposit of earth and sand, were brought together by the removal of the intervening siliceous matter through the prolonged and repeated agency of rains. Thus the surface relics were gradually let down, as it were, as the sand and earth were washed away. This may appear unsatisfactory, but the suggestion is based upon the following reasons: *first*, that the sand being fine and easily removed by water (through the agency of rains) falling over this locality and over the bluffs, follows the most natural course towards the stream, taking with it the light silicious particles, and washing them away from the pebbles, stones and implements, allowing them to be deposited in an indiscriminate mixture in the little water courses and ravines; *second*, that this has been the case is apparent from the fact of its occurrence in several places at this time; also that small embankments and hillocks occur, consisting of gravel thus deposited or brought together by the removal of the lighter soil; and at this day, after any continued or hard rains, numerous accumulations of pebbles, amongst which we find implements, are formed by the removal of earth and sand by the temporary streams.

In this way the surface remains have not been carried away from the localities upon which they had rested, but were gradually dropped to a lower horizon, until after a time they reached the stratum containing the rude and more ancient varieties.

In this connection I shall speak of several localities in Pennsylvania, one of which occupies a position in the eastern portion

of the city of Reading, and another a short distance below that city. The rude implements found at these places have been remarked upon by Mr. A. F. Berlin in a recent number of the *American Antiquarian*.[1] The first named locality is the one upon which Mr. Berlin first noticed the occurrence of rude implements bearing the typical characteristics of so-called "turtle-backs." A few days after this discovery I visited the place, and found various examples, consisting of "celts," spear-heads, arrow-heads and scrapers. These were found over a small area only, occupying the top of a small limestone bluff. A small stream known as Mineral Spring creek passes near the base of this bluff, the intervening soil consisting of loam and dèbris from the more elevated regions. Immediately above, and resting upon the stratum of limestone, is a stratum of sand and pebbles, which has been washed away along the immediate declivity of the embankment, exposing the rude relics above referred to as found by Mr. Berlin. I found that this stratum of sand was covered by earth and gravel from the neighboring hillside, with which it was continuous, excepting along the greater declivity where the rain had worn away the super-stratum, exposing the sub-stratum of sand and rounded and worn pebbles, which occurred in accumulations where they had been washed into the ravines. Modern types were also found here associated with the rude implements, but the latter were not found on the upper stratum, even where the ploughing of long continued cultivation and local denudation has removed considerable soil; but farther down the modern forms have been washed down and lowered by the removal of sand and earth to reach the more ancient stratum containing the "turtle-backs."

This stratum of sand and gravel, or, more properly speaking, pebbles, continues eastward horizontally, as was proven by the digging of a well. Nearer the hill, where this excavation was made, the workmen reached a layer of stratified sand, pebbles and cobble-stones at a depth of about forty feet. Upon examination this proved to be the level (if run horizontally towards the bluff) of the one containing the implements. Since then this stratum has been detected along the valley a short distance, proving it to be the same, the great amount of dèbris and soil from the mountain side being accounted for where the well was

[1] Vol. i, No. 1, 1878, pp. 10–12, pl. facing p. 16.

dug, because that lies nearer the slope which rises at an angle of about 16°. This fluviatile drift, as it seems to be, formed the bed of an ancient body of water; but whether the implements found date to that period or a little later, it is impossible to decide. Were it possible to continue the search by digging at various places and depths to ascertain if the implements occur elsewhere than at the bluff, more might be learned, though it is very improbable, as will be shown farther on.

Dr. F. M. Endlich informs me of the occurrence of ancient shore lines on the eastern declivity of the neighboring hills, which may mark the surface of the same stratum occurring on the western side, as the continuation may be traced interruptedly around the hills, following the course of the Schuylkill river. The implements found at the last named locality present no appreciable difference from those occurring at Uniontown. Their conformation, mineralogical composition, typical workmanship and even the color of the materials correspond in all respects. Forms from Reading are figured in the *American Antiquarian*[1] by Mr. Berlin. Some in my possession are identical in form, but several are more typical of that class found in the drift at Trenton by Dr. Abbott, and the illustration[2] given by him represents one celt perfectly. This striking similarity is certainly remarkable; and considering the persistence with which the New Jersey celts are reproduced at Reading and at Uniontown, there appears to be greater relationship between the manufactures of the three varieties than has been accredited, or that we may be able to account for. One, and it may be be considered the strongest objection to this suggestion, is, the difference in altitude above the tide water between the several localities. Another is in regard to the geological positions of the implements.

In another locality, one mile south-west of Reading, on the right bank of the Schuylkill river, numerous specimens of these similar rude implements have been obtained. They likewise consist of the same species of quartzite, and are typical "turtle-backs." This locality covers about two or three acres in extent, sloping very prominently towards the river. The soil is sandy, and differs in this respect from that lying immediately around it, has been under cultivation for the last sixty or seventy years, and

[1] Vol i, No. 1, pl, facing p. 16, figs. 1–3.

[2] Tenth Ann. Rep. Peabody Mus., i, 1877, p. 33, fig. 1, a–b.

through the repeated plowing, harrowing and the effects of rain, much of the original super-stratum have been removed, exposing the older layer of stratified sand and river gravel. With the latter we find more of the rude implements, which consist of celts, spear-heads, arrow-heads and scrapers.

In all of the localities referred to, a peculiar variety of quartzite has been employed, which was found to exist in the "cobble-stone" drift in the District of Columbia. At Reading we do not find it, nor within forty miles of that city, to my knowledge. In each of these regions, the specimens partake of a character of workmanship that is rude and primitive in the extreme, and just such implements as might reasonably be supposed to be required by a rude and primitive people.

Assuming that such a race preceded the Indians—of which there is scarcely any doubt—several important points present themselves which are difficult of solution, viz: *First*, the length of time that elapsed between the disappearance of one race and the appearance of their successors; *second*, at what approximate period the manufacturers of the rude implements occupied these regions; and *third*, whether the colony occupying the region about the Eastern Branch, was of immediate tribal connection of those whose remains survive at Reading?

In answer to the first point, nothing can be definitely known, though it would appear from slight geological evidence, that considerable time had elapsed. Various traditions have been handed down to us regarding a race corresponding to the Eskimo, which, if accepted, would allow scarcely any time for the soil to have been without occupants; for that race was, according to said tradition, driven northward by the encroachments of the Indians.

Regarding the second point, the locality in the eastern portion of Reading furnishes the greatest antiquity. Here the original stratum, in one section of which implements have been found in such a condition and under circumstances to lead us to infer that they had been buried there by the gradual accumulation of detritus from the mountains; but whether any specimens occur in the stratum of drift, at any distance under this upper accumulation, is not known. The excavation, showing the drift stratum at forty feet below the surface, is nearer the mountain, and the mass of earth and dèbris may have required but a short time for deposition geologically. Beyond this elevation the valley was, at some

remote time, submerged, but has become narrowed down through the same agency from different directions. Being guided by the manner in which the implements were found, and other meagre evidence, one would suppose them to date back to the lacustrine period, but in this we find difficulties which can be explained in answer to the third point.

The difference in elevation between this locality and that on the banks of the Schuylkill river (as well as that on the Eastern Branch) is too great for them to have been occupied simultaneously, unless we throw out the suggestion of a lacustrine period. Acting upon this, the matter becomes more comprehensible, from which may be deduced the following propositions, viz:

1st. That the three localities were occupied by a similar people, at or nearly at the same time.

2d. That these people lived chiefly upon fish, as is inferred from the implements which, under *ordinary* circumstances, would be worthless in the chase.

3d. That these typical forms of rude workmanship, indicate greater antiquity than we find represented in the rudest forms of Indians who subsequently occupied the same localities. And—

4th. That the position of some of the implements in the stratified drift, and their relation in this respect to the location of modern relics, indicates an indefinite lapse of time from the disappearance of this primitive race to the appearance of the Indians proper, whose rudest forms of workmanship are found near or upon the surface.

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RECENT LITERATURE.

BREHMS'S ANIMAL LIFE.[1]—The volumes that have been previously noticed of the series, have related to the vertebrate animals, which are naturally in a work of a thorougly popular character such as this, treated of at much greater length than the invertebrates. The present volume has been written by Prof. Oscar Schmidt, of the University of Strasburg, who is distinguished for his knowledge of the structure and mode of development of the lower animals.

This volume begins with the Crustacea, and descends through

[1] *Brehm's Thierleben.* Allegemeine Kunde des Thierreichs. Grosse Ausgabe. Zweite umgearbeitete und vermehrte Auflage. Vierte Abtheilung. Wirbellose Thiere. Zweite Band. Die Niederen Thiere. Von Dr. OSCAR SCHMIDT. Krebse, Würmer, Weichthiere, Stachelhäuter, polypenartige Thiere, Urthiere. Mit 366 Abbildungen im Text und 16 Tafeln, von JOHANNA SCHMIDT, EMIL SCHMIDT und ROBERT KRETSCHMER. Leipzig, Verlag des Bibliographischen Instituts, 1878. 11 Parts. 40 cents a part, for sale by B. Westermann & Co., New York.

the worms to the Mollusca, the Echinoderms and the Cœlenterates to the Protozoa. While we cannot agree with the learned author in some of his views on classification, the reader may be sure that the volume is a careful and reliable presentation of the more interesting facts regarding these creatures, and which should be the property of every well informed person.

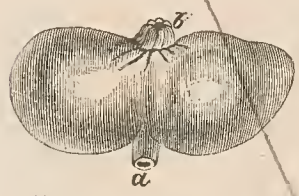

FIG. 1. — *Sacculina carcini*. Natural size.

In these days one can hardly be considered as liberally educated, who is not conversant with the physical theories as to the origin of the different forms of life; and as there are several avenues which lead up to the Vertebrates from the lower animals, no wonder that a knowledge of the lower animals, especially the groups described and figured in this volume, is quite requisite. It should be said, however, that the anticipation of vertebrate characters discoverable in the Ascidians, the Worms and the Molluscs, are recondite, and only appreciable after careful embryological and anatomical studies. This subject is only incidentally referred to by Prof. Schmidt, and perhaps the introduction of too many anatomical cuts and schematic drawings would be considered as out of place in such a work as this.

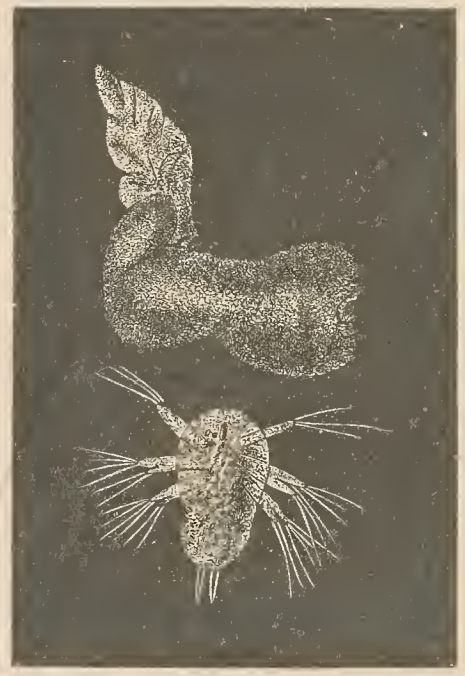

FIG. 2.—*Peltogaster curvatus;* beneath is the larva or nauplius of Parthenopea, magnified 200 times.

FIG. 3.—Lima flying through the water by opening and shutting its valves.

CURRENT NOTES ON ANTHROPOLOGY.

STONE IMPLEMENTS FROM THE POTOMAC DISTRICT.

PROFESSOR WILLIAM H. HOLMES contributes to the Fifteenth Annual Report of the Bureau of Ethnology one of his excellent and beautiful papers, this one on the 'Stone Implements of the Potomac Chesapeake Tidewater Province,' 152 pages, with 104 full-page plates, and 36 figures in the text. The geographical and geological relations of the area are carefully explained, and the artefacts themselves are examined under the classification of flaked, battered or abraded, and incised or cut stone implements and utensils. The typical forms and characters are illustrated, the processes of manufacture are set forth, and the extensive quarries where the material was obtained are described.

The conclusion of the author, after years of patient research with reference to the antiquity of man's work in this region, may be given in his own words (p. 146): "The art remains preserved to our time indicate the prevalence of extremely simple conditions of life throughout the past, and exhibit no features at variance with those characterizing the historic occupancy." So that we shall have to go elsewhere to find 'paleolithic man.'

From "Science", 1897.

Copy.

Smithsonian Institution.

January 11, 1922.

Dear Dr. Fewkes:

I have to thank you for referring to me Dr. Pierce's inquiry regarding the use of the term "paleolithic," and am glad of this opportunity to express my views regarding the use of this much abused term.

I have found by long experience in the collecting and making of chipped stone implements, that with ordinary materials such as flint, quartz, and quartzite, in roughing out blades for knives, spearheads and arrowpoints, success is rare, and I estimate that for each successful thin blade, there are left upon the shaping sites at least twenty failures. These failures necessarily display traces of the shaping work, which range from the first trial chip to the approximate blade. When I began ~~the~~ the study ~~of~~ the American problem nearly forty years ago all of these rejected failures were gathered without respect to their relation with geological strata or deposits of any kind and treasured, classed, and displayed in our Museums as "paleolithic." I soon came to realize these attributions were entirely erroneous, and took up the work of clearing the way to correct interpretations. This I found difficult since those who had once adopted the European interpretation of rudely chipped stones in America remained apparently blind to reason and in most cases held their view until the end.

To my mind the use of the terms "paleolithic" or "paleolith" in connection with American chipped stones of any kind should be avoided since this use is liable to encourage and perpetuate error. The sooner all students realize that as a rule the ruder chipped stones of America are mere failures and that probably a very high percentage of the chipped stones gathered in Europe and treasured as "paleolithic implements," are not implements at all, the better it will be for the science of Archeology and for the history of man in the world.

If the term "paleolithic" carries with it the idea of age or geological period it should not be applied in America to any object not removed from its undisturbed place in a formation or deposit of fully determined age, and by an entirely trustworthy hand.

Very sincerely yours,

(Signed) W. H. HOLMES

Director.

(2)

BUREAU OF AMERICAN ETHNOLOGY
15th Annual Report, 1893-94.

Review of my volume by Dr Brinton McGee

STONE IMPLEMENTS OF THE POTOMAC-CHESAPEAKE TIDEWATER PROVINCE.

"In many respects this monograph by Professor Holmes may be regarded as a model in method and a standard in results; and the succinct chapters and well-chosen illustrations speak for themselves. Yet there are certain features of the work summarized in the paper which are worthy of special note..

The qualifications of investigators in demonomy are, therefore, determined by three factors, viz, (1) natural aptitude, (2) training in other lines of scientific work, and (3) experience and success in demotic research. All of these factors are combined in Professor Holmes' equipment. Primarily an artist of such genius and deftness as to see a brilliant career before him, his taste for scientific studies led him first into geology, where again he was notably successful, and later into archeology, in which, from the first, he displayed especial aptitude; his training in geologic work, facilitated as it was by the exact perception and manual dexterity acquired in art work, served to render him familiar with approved scientific methods; and when, in the fullness of his vigor, he entered the field of archeology, his work was eminently successful from the outset. His archeologic researches had already extended over some years when, in 1889, he undertook the systematic study of the Potomac-Chesapeake region. His skill and success are attested by the reputation achieved in his favorits field; even before the completion of the accompanying memoir he was chosen as the head of the department of anthropology in the Field Columbian Museum, and tendered a professorship in Chicago University. His standing and qualifications may be characterized the more freely because he is no longer connected with the Bureau.

Something of the comprehensive and painstaking methods pursued in the work may be gleaned from Professor Holmes' memoir; yet the breadth and soundness of his foundation are hardly suggested by the details of the superstructure. As a geologist on the Hayden Survey of the Territories and later on the United States Geological Survey, he had occasion to traverse the western plains, the Rocky Mountain region, and the plateau country, nearly all the way from the Canadian boundary on the north to the Mexican frontier on the south, and this in early days while yet the Indians were numerous and retained their aboriginal characteristics. Accordingly he had many opportunities for ethnologic observation, and was led by previous training to give special attention to the manual arts of the tribesmen; indeed, it was chiefly his contact with the Indians in the course of his geologic work that induced him to take up systematic studies of aboriginal

arts and handicraft. During this stage of his career he learned to think as the Indian thinks about the simple native arts; he learned to imitate aboriginal methods and manipulations in the manufacture of stone; and he learned to interpret relics of primitive culture as they are interpreted by primitive minds. Thus when he turned to the examination of aboriginal relics in eastern United States his equipment in actual knowledge concerning the details of primitive art was exceptionally - indeed almost singularly - complete.

Taking up the study in a favorably conditioned province, he first acquainted himself with the work of previous investigators of the locality and with the researches and opinions of archeologists generally. He then entered the field and, with a force of laborers always under his eye, made extensive excavations and examined a body of material unprocedented in quantity. The specimens actually examined and studied could be enumerated only in thousands, measured in wagon loads, and weighed in tons. Trained by actual contact with Indians, he interpreted the specimens and their associations and the ancient quarries as they would be interpreted by Indians accustomed to such work, and every inference concerning the methods employed in quarrying, selecting material for working, shaping the objects, and manipulating the crude appliances was tested by actual imitation, the imitation itself being guided by actual knowledge of primitive methods. While this is true of all of the lines and localities of work, it is most emphatically true of the ancient quarries of quartzite bowlders and their products on Piny branch. Even here the investigation was not allowed to rest. The distribution of the products of manufacture was traced in the light of actual knowledge of Indian habits in such manner as to ascertain the genealogy and development of the implements and the various by-products, failures, culls, rejects of all sorts, as well as chips, spalls, cores, and bowlders abandoned after one or more test blows. Thus the study of a typical locality and its products was profound and thorough beyond precedent. The relics were studied with repsect to individual characteristics, with respect to form and distribution, with respect to the forces expended in their manufacture and utilization, with respect to their genesis and development, individualand collective, and with respect to the motives and designs of the prehistoric manufacturers. The work began with trained observation, passed to generalization based on unprecedented wealth of material, proceeded to inference guided by precise knowledge of primitive modes of thought and action, and went on to verification by imitation and by comparison with known homologues. In extent and thoroughness of study, in wealth of material examined, in thoroughness and scientific character of the investigation, Professor Holmes' work on the quartzite quarries and their products may safely be considered to stand unrivaled, at least so far as the Western Hemisphere is concerned.

The results of the work are set forth too fully in the introductory and concluding divisions of the monograph to require repetition; yet one of the conclusions would seem to be worthy of special emphasis; the outcome of the quartzite quarries and implements suffices to demonstrate that whatsoever be true of other countried and provinces, the rudely flaked stones of the Potomac-Chesapeake province do not represent a lower or more primitive culture than that of the Indians found in the province by John Smith and other explorers, and do represent the by-products, waste, or rejectage, or stone-working by the Algonquian and neighboring Indians. Thus, whatsoever be true of other districts, in this district the rudest stonework known to the archeologist and the finest stone carving, pottery, basketry, and woodwork represent a single culture stage. This conclusion is not put forth tentatively or provisionally, but as a final result of the most thorough single piece of archeologic research ever conducted in America.

While the chief subject of the monograph is the description and discussion of the quartzite quarries and implements, there are other features of note. The account of the quarrying and manufacture of steatite depicts with remarkable fullness and clearness a little-understood phase of aboriginal art in eastern United States. The tracing of several materials used in primitive art to their sources in distant mountains is one of the minor triumphs of American archeology, and illustrates well the thoroughness of the methods pursued in the work; and there are other features worthy of careful attention by students of archeology." (Pages XCIV-XCV-XCVI-XCVII)

BUREAU OF AMERICAN ETHNOLOGY

1894

My work in the Bureau of Ethnology for the year 1893 and the first six months of 1894 was well up to date when I was induced to resign from the Bureau and accept the curatorship of anthropology in the Field Columbian Museum, Chicago. Two important papers were practically ready for publication. One of these relates to the stone art of the aborigines as exemplified by the collections made in the tide water region adjacent to Chesapeake Bay; the second to the fictile art as exemplified in the collections from the eastern United States, especially from the mounds. While both papers were substantially complete as to the letter press, they were incomplete as to illustrations, but this work was in the hands of Mr. De Lancey Gill who has had charge of the illustration work of the Bureau for many years.

In the Report of the Bureau of American Ethnology for 1894 reference was made to my resignation in the following terms:

> "The Director notes with regret that Professor W. H. Holmes who has for some years been in charge of the archeological work of the Bureau has severed his connection with the Bureau in order to accept an important position in the Field Columbian Museum, Chicago."

BUREAU OF AMERICAN ETHNOLOGY
15th Annual Report, 1893-94.

"Professor W. H. Holmes was occupied throughout the year in archeologic researches, chiefly in eastern United States. The first half of July was spent in organizing the work of the year, and later he proceeded to different points in Delaware valley for the purpose of continuing studies of ancient quarries and quarry shops. A new quarry shop was discovered on Delaware river, 15 miles above Trenton, yielding rejects corresponding precisely with the objects so abundantly found in the gravels on which the city of Trenton is built, and which were formerly classed as paleoliths. Subsequently he visited a number of interesting localities in Ohio, giving especial attention to the gravels at Newcomerstown, in or apparently in which an artificially shaped stone has been found, this being the only case now strongly held to indicate the existence of man during the Glacial period in this country.

In October he visited an island in Potomac river, near Point of Rocks, flooded by a recent freshet in such manner as to lay bare an ancient village and aboriginal workshop. This workshop proved of considerable interest in that here unmistakable indication was found for the first time that blocks of stone were used as anvils in the production of certain classes of stone implements and weapons.

During February Professor Holmes directed the exploration, by Mr. William Dinwiddie, of an aboriginal steatite quarry near Clifton, Virginia. This quarry was found especially instructive by reason of its large size, the great number of partly completed utensils found within the opening and in the neighboring dump heap, and the excellence of its preservation.

In April Professor Holmes, accompanied by Mr. McGee, Ethnologist in Charge, repaired to an interesting site near the mouth of Pass creed, not far from Luray, Virginia, for the purpose of collecting additional data relating to a noteworthy series of stone art products, to which attention was called during the preceding fiscal year by Mr. Gerard Fowke.

A considerable additional collection was made and an aboriginal cemetery, from which a typical collection of mortuary pottery was taken, was discovered in a neighboring field. The stone art products in this locality are of exceptional interest, as the "Turtleback" forms are rejects from the manufacture of celts. The rejects hitherto studied by Professor Holmes represent, exclusively or predominantly, narrow-pointed instruments, such as spearpoints or arrowheads, while those found at the mouth of Pass creek represent predominantly the manufacture of broad and thin pointed objects. A sufficiently complete series of rejects and nearly completed forms to illustrate all stages in manufacturing was brought together." (Pages LXXIII-LXXIV)

THE Indian arsenal, or the Indian armory, or the Indian workshop of Piney branch, as the interesting place is variously called, came in for a larger measure of notoriety or popular notice during the Pan-American Congress than it has ever had before. The stony little tract has been the subject of official reports, but, unless those reports happen to be reprinted in newspapers and translated into United States, very few persons learn of them, even though, as sometimes happens, really interesting facts are concealed in them. So, it is probable that not many persons have ever heard of or learned much about the Indian workshop on Piney branch through the reading of government reports.

In the ethnological exhibit in the National Museum is a group of American Indians engaged in the work of making stone arrowheads, and the varlous processes of this work are illustrated. As the Rambler recalls this exhibit, there are five Indians in the group, and the descriptive card on the big glass case in which the Indians are represented as at work gives the information that the scene is supposed to be on Piney branch, at a point about where 18th street, if extended, would cross the valley through which Piney branch flows, or through which Piney branch did flow untll a great sewer was built along most of its course.

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* *

That exhibit has been in the National Museum for several years, and a vast number of Americans from outside of Washington have stood before the picturesque group, studied the art of making arrowheads and have read the descriptive card. Some Washingtonians have seen the group, and all of them might if they cared enough about the wonderful things on view in the museum to make a trip through the old and new buildings. Perhaps it is too much to expect that Washington people should go sightseeing in the capital of the United States, especially as they must conserve their energies for sightseeing during vacation time at Atlantic City, Chesapeake Beach, Colonial Beach or other wonder-towns which make the great museums, libraries and galleries at Washington seem so dull.

A few days before the assembling of the Pan-American Congress there was printed in the news columns of The Star this: "Plans for the entertainment and enlightenment of visiting scientists who are to attend the coming Pan-American Scientific Congress here were altered today when Dr. William H. Holmes, head curator of the Smithsonian Institution, announced that the orlginal intention to show the scientists the remains of a great quarry within three miles of the White House had been abandoned. This quarry, which ls situated on Piney branch, an outlet of Rock creek, near their junction, is said to have been worked by prehistoric stone masons of America before the pyramids of Egypt were built. Beside the branch there is an extensive area filled with the refuse of aboriginal workshops, chips of quartz, broken and partially shaped implements, hammer stones and anvils, to a depth of ten feet in places. The winter weather will cause the abandonment of the original plan to show the visiting scientists deposits which, perhaps, few Washingtonians know are so near their homes."

In that news story there was some poetic license, reportorial license, geographic license or something euphemistic for a "bad break" in the statement that this quarry is situated "on Piney branch, an outlet of Rock creek, near their junction." Everybody acquainted with Piney branch and most of those persons familiar with Rock creek know that Piney branch is not an "outlet of Rock creek." However, no harm has been done to Piney branch or Rock creek.

With a wooded and rocky ravine, having its general direction from northeast to southwest, extending from the District llne near Takoma to Rock creek a little north of the Zoological grounds, and bisecting the northern part of Washington, whlch has had such a remarkable growth within a few years, it should not be difficult for anybody to find a way into this territory. A large proportion of Washington people must already be familiar wlth it. While the valley of the branch is quite wide as lt winds southeast of Brightwood and to the north of Petworth, it expands considerably as it approaches the point where 16th street has been filled over and extended across it, and its wildest section is that between 16th street and Rock creek, with a closely built-up part of Mount Pleasant on the southerly side and the woods of the Blagden property on the northerly side.

The scenery of this sectlon of Piney branch is, perhaps, no finer than was the scenery of the more easterly sections, but the lower part has been added to Rock Creek Park, while the upper part, unhappily not so preserved, has suffered from the upbuilding of the city. A great sewer was constructed along much of the course of Piney branch, and the creek was turned into this, and much of the splendor of the scenery of the vale was destroyed. The sewer has its portal a little way below the 16th street fill, and the creek water which now flows in much diminished volume over the stones and around the bowlders of the creek bed is mixed with sewage. It might be better to say that lt is sewage which now flows through the bed of the once sparkling creek.

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At the head of Mount Pleasant street a narrow and well built, though not yet a highly improved, street leads north. It is 17th street. Some especially pleasing homes abut on this street, and some very handsome places lie just off it. A little way along its course 17th street begins to go sharply down grade, the houses on its sides become few, the sidewalks end and the road bed becomes stony, and otherwise rough. Woods grow on both sides of the way, and, following the down grade, one soon comes to the bottom of the valley of Piney branch. Through this valley, but nearer to the northerly than the southerly slope, flows, what before the building of the sewer was Piney branch. The bed of the stream is strewn with bowlders. Many of these are large, irregular blocks of gneiss and granitic or granitoid rocks. Some appear to have come into the creek bottom by having been dislodged from the valley slopes, and then, finding temporary lodgment in the creek bed, seem to have been carried along by the force of flood waters until encountering an obstruction strong enough to hold them. Some of the bowlders in the creek bottom appear to be part of the basic rock masses of the earth exposed by the age-long process which has worn the stream bed from the top of the adjacent highland to its present level.

Among these bowlders, and in many places covering them, are myriads of water-worn stones, ranging from the size of a man's hat to the size of an apple or orange, and then on down to pebbles from the size of a walnut or pecan to the size of a pea. Below the size of a pea are millions of minute pebbles, and these merge into coarse sand, some of which has been brought from a distance by the water and some of which has been produced nearly on the spot by the grinding of the pebbles and the rocks.

Mingled with the bowlders are many pieces of quartz, some of them much too heavy for a man to lift. These have evidently been brought down into the creek bottom from the higher land, because even on the top of the terrace or as outcrops in the upper slopes of the valley one sees much of this character of rock. Much of this quartz is white, creamy or translucent, and much of it is iron-stained, and its weathered surfaces are colored various hues of yellow, orange, brown and tints that approach red. Between the bowlders of gneiss and these big fragments of quartz are the water-worn stones, smooth of surface but of many forms, some nearly round, some flat and some oval. In the creek are spaces where stones of this character extend for many square yards, areas in which no bowlders or quartz blocks appear. The effect is that which might be given by masses of cobblestones, and certain excavations which have been made in this territory for the purpose of improving Rock Creek Park show that these cobble masses are deep.

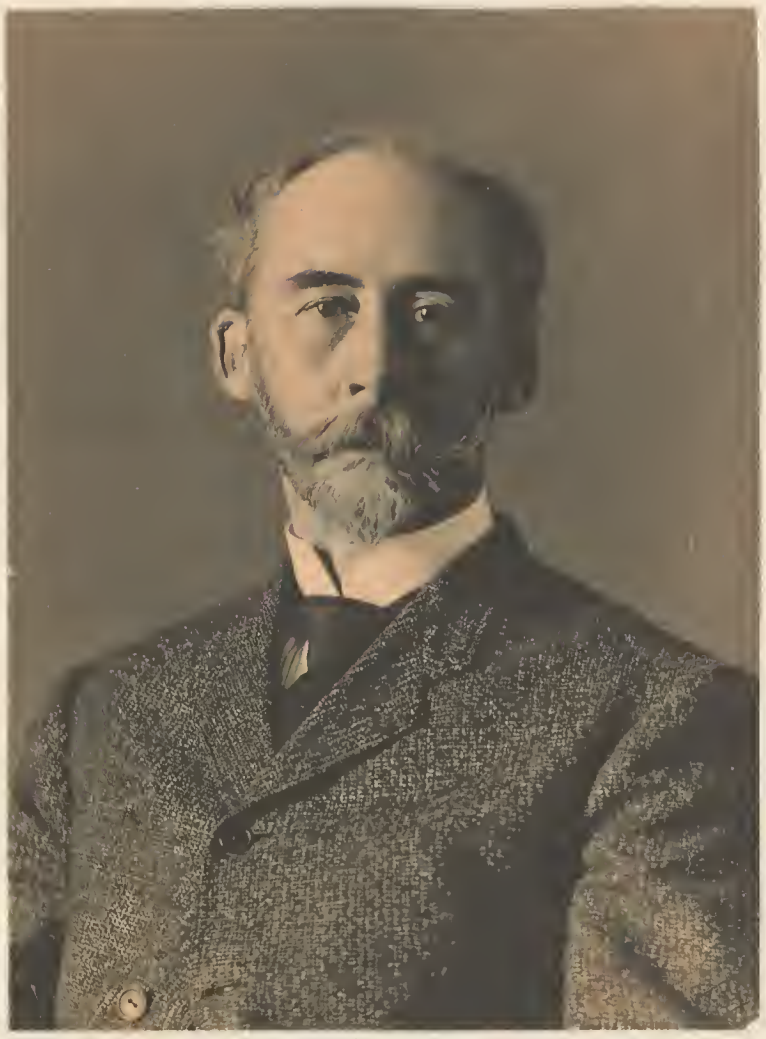
An usually large number of these water-worn stones have been broken and chips and larger fragments may be found, though the Rambler has been told that the great body of these fragmentary masses are to be found by digging. The water-worn stones in their colors are brown, plain dirt color, gray and slatish-pink. In texture they are flinty. Among them are smaller stones of a quartz character, and some of these are milk-white, colorless and translucent, and pink and here and there a small red stone may be found. The stones mentioned here are those of which the Indians wrought arrow heads, spear heads and stone axes. Explorers reasoning from the countless number of defective and broken weapons and from the deposits of chips split and splintered off in the fashioning of stone weapons have identified this part of Piney branch as one of the large and old workshops of the Indians of the Potomac region. It is certainly an interesting place.

The slopes of the valley are worth a trip to the Piney brinch neighborhood because there are so many rustic touches close to the paved and heavily traveled ways of the city. The general nature of the growth is oak, while evergreen shines among the bare trees and the thick carpet of fallen, crinkling leaves. The evergreen which grows here is that which most folk call laurel, and which really is a species of laurel and a member of the great heath family. Every one is familiar with the blossoms of this plant in spring and early summer. Sometimes it is called rhododendron and sometimes calico bush, but most persons call it "mountain laurel." Another name for it among the colored folk who gather it for various purposes is "wild ivy," or "wild ivory."

The number of persons who visit the Indian workshop is very small when compared with the number passing close to but above it. A great deal of the travel into Rock Creek Park passes down Park road. At the top of Klingle road the main tide of automobile traffic turns to the right, passing a long row of houses built on a terrace. These houses are on the east side of the street. On the west is park land, a steep hillside covered with big trees. This road leads over a high bridge which spans Piney Branch valley a few hundred yards above its mouth. Under that bridge the scientists have found much of the debris from the Indian workshop, though the greater quantity of the stone age refuse is said to lie a city block or two eastward from the point where the bridge has been thrown across the valley.

There is a proposition that this Indian workshop be preserved and appropriately marked. One of the resolutions approved by the Pan-American Congress recited: "Many parts of the American continent are rich in archeological remains, such as ruins, monuments and burial sites containing many examples of industry and art of the aborigines; that scientific explorations of these remains, with the study of resulting finds, are objects of utmost importance, for on their basis only will it be possible to reconstruct the lost history of the American race; and in order that such remains may be saved to science and not be wantonly exploited or destroyed before they could be studied it is essential that proper laws and regulations be adopted by the various countries where such remains exist."

In the office of the surveyor of the District of Columbia is a topographic map of the District "surveyed in the years 1856, 1857, 1858 and 1859 by A. Boschke and published by D. McClelland, Blanchard and Mohun of Washington, D. C., in 1861." This old map shows Piney branch rising near the Left Fork road in the vicinity of the lands then owned by Dr. Noble W. Bladen, Mrs. C. Sanders, William Morrison and Mrs. S. A. Greeves. South of the 7th street pike Piney branch ran through or close to the lands of J. Saul, A. Ray, E. Osborn and "W. Osborn heirs." Those lands were all situated along Piney branch between the 7th street pike and the 14th street road. Between the 14th street road and the Pierce Mill road the property holders along and close upon Piney branch were Thomas Blagden, H. Waldbridge and W. Selden. The Blagden tract was the largest in that vicinity.



With
at Ithaca 1907

Photographed in 1907.

When the quarry shop figures were finished in the Museum they were carried out to the quarries and set up there as if actually at work. At the left is a model of one of their rush houses with other belongings.

On Privy Branch

A Review by
A. D. FRASER

AMERICAN ANTIQUITIES. Part I. Introductory. The Lithic Industries. By W. H. Holmes. Bureau of American Ethnology, Bulletin Sixty. Washington: Government Printing Office.

SPEAKING in very general terms, we may say that Mr. Holmes has done for American archaeology a service similar to that rendered a few years ago by Prof. Osborn to the study of the conditions attending the human race in Europe in Palaeolithic times. That is to say, he has expended great labor and thought on the collection, from widely scattered and sometimes almost inaccessible sources, of all the most important facts which may be marshaled with a view to throwing light on the prehistoric cultures and pre-Columbian conditions of the races inhabiting the central and northern regions of our continent. The difficulty of the task can hardly be overstated. Prehistoric man in Europe presents a problem sufficiently complicated, to be sure, but it is simple as contrasted with his representative in America—in the present state of our knowledge, at least. On the continent of Europe, the culture-stations of France alone, together with those of the northern parts of Spain and Italy, present us with what constitutes an almost complete picture of the activities of mankind in that region during, let us say, the past 50,000 years. Long-continued and intensive study, likewise, of the surviving human remains and artifacts has been successful in producing an elaborate system of chronology and classification; so that the modern European archaeologist or palaeontologist has now a reasonably sure footing of hypothesis and fact on which to base his researches. In the Western Hemisphere, on the other hand, the circumstances are altogether different. The extent of the territory is vast, and not until recently has the subject of prehistoric archaeology met with the attention that its importance would seem to call for. Furthermore, an additional element of difficulty and often confusion is introduced into the study by reason of the survival of so many ancient American types of culture up through historical times, and that too in an almost unaltered state. The proper disentangling of the threads of evidence is surely a colossal task.

Nevertheless, Mr. Holmes has been successful in putting into the hands of the student and the general reader a volume containing a highly satisfactory treatment of the subject—a work which marks a definite epoch in American prehistoric studies. The book, large as it is, is intended as an introduction only, and is to be followed, as the preface informs us, by a second volume, to be devoted "exclusively to the implements, utensils, and other minor artifacts of stone." The southern limit of the territory covered in the present work is the Rio Grande; so that the United States, Canada, and Alaska alone are taken into consideration. It is somewhat disappointing that, owing to this selection, the writer does not furnish us with a description of the great Central American Maya civilization, the knowledge of which is being rapidly disseminated through the efforts of the Maya society.

Not the least interesting part of the volume is that which treats of the probable antiquity of man in America. The autochthonous theory—or the supposition that the human race originated in this continent—is now almost a dead letter, and is dismissed in a few sentences. Commencing, however, with the premise that all American prehistoric cultures as yet studied appear to belong to the Neolithic, or New Stone Age, type, the author proceeds to examine the evidence connected with certain important discoveries which would seem to argue for a high antiquity of man in America. In particular, he investigates the conditions attending the discovery of (a) the Calaveras skull, found in California, and said to have been recovered from Tertiary gravels at a depth of 130 feet; (b) the Lansing skull, dug up in the State of Kansas in 1902 from under twenty feet of undisturbed silt; (c) a fragment of a stone pestle found embedded in gravels underlying the lava-cap of the Table Mountain; (d) the "Nampa Image," a small figurine, said to have been brought up from some ancient deposits in Nampa, Idaho. But the conclusion reached by Mr. Holmes in each and every case is that the testimony, while worthy of the most careful consideration, is hardly convincing. In this connection he well remarks:

> The superficial formations from which the evidence has been and must be derived are treacherous custodians of the records entrusted to their keeping. The waters uncover, transport, intermingle and redeposit the traces of man's presence; ice scores deeply into the surface, likewise destroying the normal sequence; the winds sweep the sands into deceptive semblance of stratification, burying and uncovering and burying again the relics of all periods, imposing thus on the unwary student false and conflicting

chronologies * * * and man and beast are ever at work digging and boring and preparing the ground for abundant crops of misleading observations and erroneous interpretations.

In fine, the writer sees no reason to believe—in the light of our present knowledge—that man found his way into America until after the close of the glacial period; when the great ice-fields, which had covered Canada and the Northern States, had finally receded, leaving the form of the continent and its climatic conditions essentially as they are today. He thus sums up the case:

> It cannot be allowed that the Tertiary, or even the Pleistocene, occupancy of the American Continent by the race is demonstrated, and the writer prefers to favor the view * * * that the continent was probably not reached and occupied until after the final retreat of the glacial ice from middle North America. At the same time it must be granted that there is no apparent reason why, if already occupying Northern Asia, man should not have reached American shores by way of Bering Strait during any of the periods of mild climate which preceded and interrupted the Ice Age; yet we may wisely await the results of further research and provide for the application to these of the severest tests that science can devise.

[illegible] passage is characteristic of the author's attitude throughout.

As to how the red man, if not indigenous, came to enter America, and by what route or routes, are questions which we have all heard discussed at one time or another. Did he cross to Alaska from northeastern Asia, following the chain of Aleutian Isles? Or did he come in his dugout in Summer, or over the ice in Winter, across the Bering Strait? Or, as even some eminent scholars suppose, did man enter the continent from the east, following a "land bridge," which is thought to have spanned the North Atlantic in pre-glacial or glacial times? Or can it be that he followed the modern Atlantic steamship route—assisted in his voyage by the presence of the fabled Atlantis? Or is South America the earliest home of the Indian in this hemisphere, a haven reached by way of the Southern Pacific? These and other theories we have all heard supported by arguments ingenious or otherwise.

The possibilities are examined in detail by Mr. Holmes, who, after careful consideration, decides in favor of the traditional view, which on a priori grounds is undoubtedly the most probable, that our first settlers arrived by way of Bering Strait. The Middle Atlantic and the South Pacific theories present almost insuperable difficulties, while the North Atlantic view, rational as it appears to be in many respects, is rendered extremely hazardous—in failure of real evidence—from the assertion of many geologists that there is no valid reason for believing in the elevation of the bed of this ocean in either pre-glacial or glacial times. Accepting, therefore, the Bering Strait theory, the author points out that a vast extent of time, in all likelihood, must have intervened between the migration of man from his original home and his arrival in America. The assumption is that the cradle of the human race was in the south of Asia, in the vicinity of the one hundredth meridian. This, we may observe, is the current orthodox view, based, in the main, on the discovery of the skull of pithecanthropus erectus, or the ape-man, in the Island of Java. With the acceptance of this as an hypothesis, it is easy to see that the migration of man to the northeast, along the 10,000 miles of rugged coast to the shores of Bering Strait, must needs have covered a period measured, not by thousands, but by tens of thousands of years. The primitive wanderer may be supposed to have followed the southern margin of the retreating ice fields, the rate of his progress being in inverse proportion to the distance attained from his tropical homeland. Arrived in Alaska, however, conditions would be reversed, and upon his reaching the great northwestern plains of Canada, a relatively rapid dispersal of the tribes over the two continents may well have followed.

Passing from the theoretical part of "The Lithic Industries"—the author considers his wide field by way of areas or territories, of which he enumerates eleven in the United States, Canada and Alaska, from the "Arctic Coast Area" to the "Arid Area" on the Mexican border. A sketch is also presented of eleven other cultural areas of Middle and South America. We have an account of the distinguishing features of each locality, together with the various tribes inhabiting them and their external conditions. From Chapter 12 to Chapter 27 we have an elaborate description of the aboriginal mines and quarries which are to be found scattered all over the country, and which comprise workings in a great variety of geological formations. The concluding hundred pages of the memoir are taken up with a series of studies in what we may term "processes;" in other words, the primitive methods of working in stone and preparing the so-called "artifacts." This section serves as a noteworthy contribution not only to the archaeology of this country, but likewise to that of all primeval cultures. Thus we have the "fracture processes," "crumbling processes," "abrading processes" and "incising and piercing processes" explained and portrayed. The results are obtained partly by conjecture, partly by painstaking experiment, and partly by close observation of the activities of the modern descendant of the ancient red man. The whole is rendered doubly instructive and illuminating—as indeed is the case throughout the entire work—by the presence of a large number of photographs and other illustrations.

The impression left by the perusal of such a work as "The Lithic Industries" is that we are "getting on"—as Professor Murray of Oxford said a few years ago in reference to Homeric studies—in our researches in American antiquities. The efforts of Mr. Holmes, in the language of Fenimore Cooper, have served to clear the way of briers. Future explorations in this field will doubtless disclose great things.

VOLUME VI

SECTION II The Soapstone Quarries of West Washington and Near-by Virginia.

STEATITE QUARRIES.

Steatite is a soft, tough, talcose rock commonly called soapstone which occurs in massive bodies in connection with other metamorphic rocks. It was much used by the Indian tribes north of Mexico in their arts. It was employed for the manufacture of cooking utensils,lamps, tobacco pipes, amulets, ornaments, and various miscellaneous sculptures. It has the very desirable quality of resistance to the act on of fire and is readily carved and susceptible of a high finish. The color when fresh is usually a somewhat greenish gray but when polished and subjected to long continued handling it becomes almost black, presenting an attractive appearance.

The aborigines in their search for materials capable of serving them in their simple manual arts,

probably discovered and attempted to utilize loose masses of the soft and tough stone known to us as steatite or soapstone. We may safely surmise that step by step the peculiar qualitis and adaptabilities of the material were developed and that often the convenient loose masses were exhausted, the rock in place was attacked where it outcropped in the stream beds and on the hillsides

23. An Uncovered Soapstone Quarry.

Prof.W.J.McGee Mrs. ____ Owner of the site

Mrs. W. J. McGee Dr. David T. Day

Prof. O.T. Mason Prof.R.D.Saulsbury of Chicago

24. Soapstone Quarry in West Washington - cleaned up.

TITE MINES.

The early occupants of the Potomac region, in their search for materials capable of serving them in their simple arts, probably discovered and attempted to utilize loose masses of the soft and tough stone known to us as steatite or soapstone. The progress toward its extensive utilization was no doubt very slow, and unless previous knowledge of such stone had been gained elsewhere, must have continued for centuries. Step by step the peculiar qualities and adaptabilities of the material were developed and diligent search was made for it throughout the highland. When the convenient loose masses were exhausted, the rock in place was attacked where it outcropped in the stream beds and on the hillsides, and partially detached portions were pried or broken off; then the process of uncovering followed and the quarrying industry was initiated. Sharp stones were employed to cut off projecting pieces, and finally cutting tools were made and improved, so that

the solid stone could be removed to considerable depths.

We are not able to discover just what devices were employed in the preliminary quarry work. The earth was probably loosened with wooden pikes and with picks of stone and antler, and was thrown up with the hands or carried out in baskets of bark or cane, or in skins. As the quarrying advanced the older pits were filled with the debris, and evidences of the operations were much obscured. It is only when the pits are fully cleaned out that we come to realize the full nature and extent of the ancient work. Our excavations brought to light surprising evidences of the energy, perseverance, and skill of the native miner, and showed the practice of an art totally distinct from that carried on in the bowlder quarries of Piny branch.

NG AND SHAPING OPERATIONS.

The method of conducting the quarry work was substantially as follows: When a sufficient area of the solid stone had been uncovered, the workmen proceeded with pick and chisel to detach such portions as were desired. If this surface happened to be uneven, the projections or convexities were utilized, and the cutting was not difficult; if the rock was massive and the surface flat, a circular groove was cut, outlining the mass to be removed, and the cutting was continued until a depth was reached corresponding to the height of the utensil to be made; then, by undercutting, the nucleus was detached or so far severed that it could be broken off by means of sledges or levers. If the stone happened to be laminated, a circular groove was cut through at right angles to the bedding, and the discoid mass was removed without the need of undercutting. If the conditions were favorable, a second disk was

cut adjoining the first, and then a third, and so on, pretty much as the housewife cuts up the thin layer of dough in biscuit making.

In cases where the floor and walls of a well-developed quarry are fully exposed, as in the Clifton and Amelia county quarries in Virginia, the details of ancient operations are clearly displayed. In cases it is seen that the task of cutting out the mass was just begun when oprations in the quarry closed, while in others it was well under way and the bulbous nuclei stand out in bold relief. In cases where undercutting has taken place the rounded form resembles a mushroom on its stem and is ready to be removed by a blow; while in many other cases we see only roundish depressions in the quarry surface, in the bottoms of which are stumps or scars indicating that removal of the mass had taken place. It often happened that the

work of cutting was stopped by the discovery of defects in the stone. In very many cases defects were not discovered until too late, and the operations of removal at the last moment became abortive; instead of breaking off at the base, as was intended, the cleavage of the stone was such that the body split in two, leaving a portion remaining attached to the stem. The drawing presented in plate LXXVI will give a more satisfactory idea of the whole range of phenomena than can any mere description.

"A notable feature of the cutting out of these masses of stone is the attendant shaping of the mass, which was rudely sculptured as the work went on, the contour of the vessel being approximately developed. Although I have seen no good examples of this class, it is confidently stated by others that rude nodes were carved at opposite ends of the mass as incipient

handles, and that excavation of the bowl was begun, so that when severed from the stem the vessel was already well under way.

ARRY PRODUCT. So far as I have observed, the quarries rarely yield evidence of the prosecution of any other shaping work than that of obtaining the rounded bodies of stone and the partial development of vessels. Pipes, sinkers, ceremonial stones, and ornaments were made by the same people, but mostly no doubt from choice bits of stone carried away for the purpose, or perhaps often from fragments of vessels broken in use.

About the quarries and in the quarry debris are specimens exhibiting every stage of the vessel-shaping work; irregular fragments and well-rounded masses just as cut from the quarry, but usually showing some defect of texture or shape, explaining their desertion or rejection; other pieces partly shaped before the defects

became apparent; and very many specimens broken by the blows of the shaping tools, as illustrated in plate LXXVII; so that every step of the work and every phase of the shaping operations are fully represented. The rough-dressed shapes vary a good deal with the different quarries, though on the whole there is decided uniformity in the work as carried on throughout the soapstone belt. Final forms, as shown by village-site remains, are limited to shallow trays or dishes, trough-like forms, and deep basins. Nowhere in eastern United States were pots made of the deep globular form so common in California.

A prevailing shape in the Potomac-Chesapeake region is an oblong basin with ear-like projections or handles at the ends. The largest specimens are about 25 inches in length. The width is often hardly more than half the

length, and the depth averages perhaps one-half the width. This form may have been suggested by wooden dishes or mortars of like shape, examples of which are still in use among some of the Algonquian tribes. Other forms approach more nearly a circular outline, as viewed from above, and these usually have greater depth. In cases the outline is somewhat rectangular. Roughed-out cups of small size are sometimes found. (W. H. Holmes in 15th Annual Report B. A. E., 1893-94.)

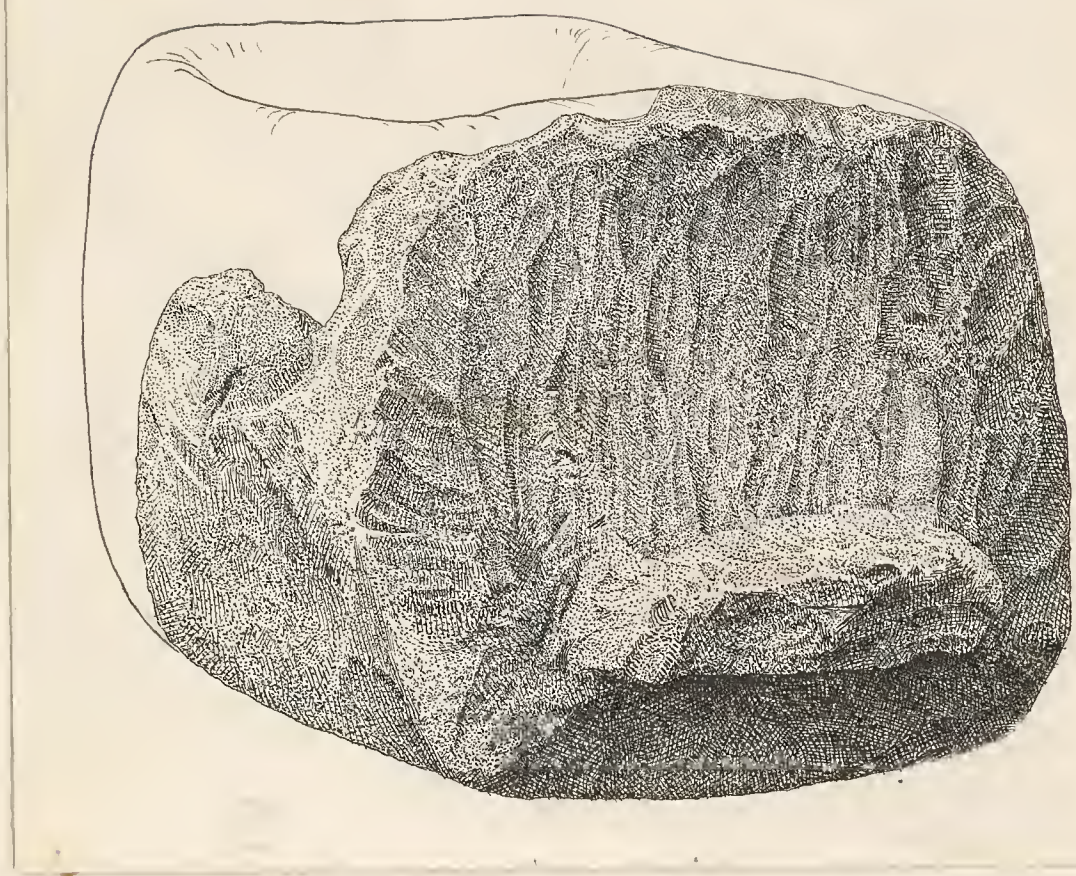
25. THE POT MAKERS

Model showing the operation of a California soapstone quarry

TRACES OF ABORIGINAL WORK IN SOAPSTONE QUARRY, SANTA CATALINA ISLAND.

26. Scars left by the removal of incipient pots.

27. Failures in Pot Making.



28. Failures in Pot Making.

29. Stone Chisels used in Pot Making.

30. Stone Chisels used in Pot Making.

VOLUME VI

SECTION III ABORIGINAL PAINT MINES

ABORIGINAL PAINT MINE GROUP

Museum Label

The Indian tribes were not acquainted with iron as a malleable or fusible metal, but employed the harder iron ores merely as a kind of stone. The solid ore, usually a hematite, had the advantage over stone of being exceedingly heavy. Fragments and waterworn masses of this material were gathered for implements from the surface and from the beds of streams. In recent years, when our miners began working a large body of iron ore near St. Louis, Missouri, they were surprised to find the deposit honeycombed by irregular tunnels or burrows down to a depth of twenty-five feet or more. From these old tunnelings, upward of 1200 rude mining implements of stone were thrown out. The Indians had doubtless used these in breaking up the compact bodies of ore, and had obtained large quanties of the red and yellow ochers which occur distributed throughout the deposit for use as paint, a most essential feature of the native toilet.

This showcase is represented as containing a solid block of the reddish, impure ore, within which the ancient miners are conducting their very primitive, but extraordinary operations. One man is engaged in breaking up the ore while the other (not seen in the photograph) crawls upward toward the surface, carrying a load of the red and yellow ochers in a basket.

(3)

St. Louis, Mo.,

Mr W H Holmes
Smithsonian Institution,
Washington.

April 10th, 1903

Dear sir-

Tuesday of this week I was notified, through the Missouri Historical Society (of which I am an officer) of a very remarkable discovery of archaeological specimens near this city; the following day I visited the locality, and was very much surprised at the magnitude of the find.

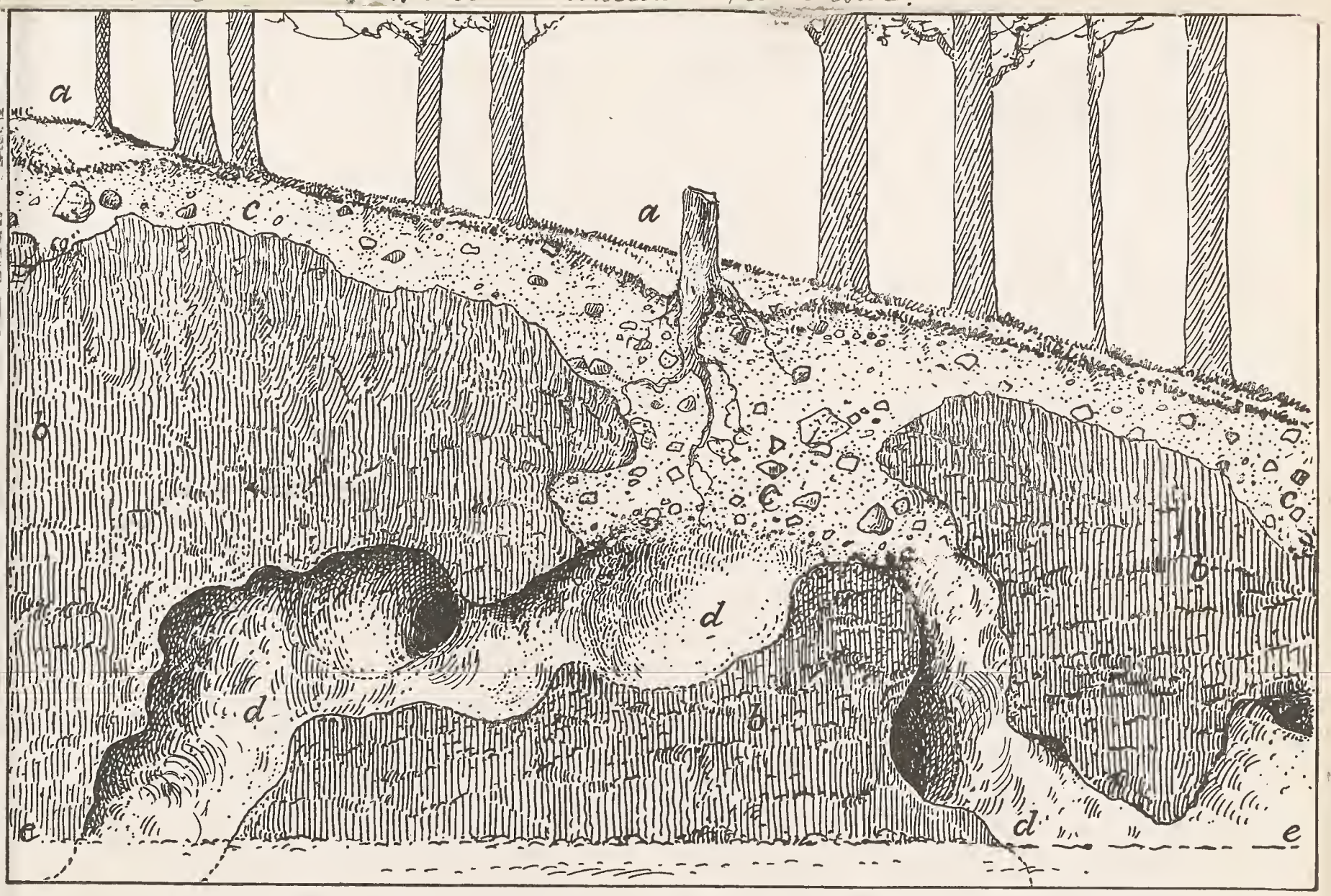
Thinking it might be of interest to your institution I wired you early this morning as follows-" Recently discovered near St Louis hundreds rough hematite and granite grooved mauls in iron ore pocket-well worth investigating" which confirm. The area, from which ore has already been removed, is comparatively small, say 7o to 8o feet square. Everything points to the fact that the entire ore bed has been turned over, and all through the ore is found any number of grooved mauls, material of majority, is hematite. I took a number of photographs, two of which I enclose, one showing a pile, which I estimated to contain more than six hundred implements, weighing four to fifteen pounds. The second photo shows general appearance of the mine, openings shown were seemingly made by the aboriginies, and their mauls are found everywhere. With a pick I loosened seven in less than ten minutes at a point near lower right hand cover of photograph No. 2 As stated in my message to you, I think this discovery well worth a thorough investigation by your institution, and I will gladly render all assistance possible. Will add, quite a number of rather rough flint arrow points and spear heads, as well as few gauges have been found with the mauls; also an occasional finished hematite ax, showing rough usage.

Will thank you for your opinion relative to this discovery.

Very truly yours,

A F Bandelier

Modern Ore Mining Exposes the Ancient Excavations.



SECTION INDICATING THE MANNER IN WHICH THE ANCIENT GALLERIES OR BORINGS PENETRATE THE ORE BODY.

Section Indicating the Nature of the Ancient Tunneling

Entrance to one of the Ancient Tunnels.

Section of the Museum Model Exposing Model of the Ancient Miner.

The pile of 1200 mining tools collected by workmen in the mines

D. D. Bushnell. Dr Whelpley S. H. Cox. W. H. Holmes.

The Visiting Party

TRACES OF ABORIGINAL OPERATIONS IN AN IRON MINE NEAR LESLIE, MISSOURI

BY

W. H. HOLMES

(Reprinted from the AMERICAN ANTHROPOLOGIST (N. S.), Vol. 5, No. 3
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TRACES OF ABORIGINAL OPERATIONS IN AN IRON MINE NEAR LESLIE, MISSOURI

BY W. H. HOLMES

Early in April, 1903, a communication was received by the Bureau of American Ethnology from Dr S. W. Cox, of Cuba, Missouri, stating that evidences of ancient mining operations had been discovered in an iron mine operated by him near Leslie, Franklin county. This report was confirmed by Mr D. I. Bushnell and other St Louis archeologists, and the present writer, who is especially interested in the quarrying and mining industries of the aborigines, repaired at once to Leslie to make a study of the interesting phenomena.

It was found that the miners had encountered a body of iron ore, of unknown depth and horizontal extent, lying immediately beneath the surface of the soil on a gentle slope reaching down to the banks of Big creek, a branch of Bourbois river, and that they had removed the ore from a space about a hundred feet wide, one hundred and fifty feet long, and to a depth at the deepest part of between fifteen and twenty feet. In beginning the work traces of ancient excavations were observed, penetrating the soil which covered the surface of the ore body to a depth of from one to five feet; and as the work progressed it was found that the ore had been fairly honeycombed by the ancient people, the passage-ways extending even below the present floor of the mine. There were many partially filled galleries, generally narrow and sinuous; but now and then larger openings appeared, two of these being of sufficient dimensions to accommodate standing workmen.

In the débris of the old excavations many rude stone implements were encountered, and upward of a thousand of these had been gathered by the miners into a heap on the margin of the mine. These sledges are exceedingly rude, consisting of hard masses of stone or hematite weighing from one to five pounds, and roughly grooved, or notched, for the attachment of withe handles. The

great number of these implements made it certain that extensive operations had been carried on by the ancients, but the exact nature of the work was not readily determinable. The first impression was that the compact masses of hematite were sought for the purpose of manufacturing implements such as were employed by the mound-building tribes in many parts of the Mississippi valley; but examination revealed few traces of the shaping of this material, save that it had been used in making the rude sledge-heads or hammers found in the mine. In breaking up the ore the white miners encountered small irregular seams and masses of flint, but these were too limited in extent and too brittle in texture to have been employed successfully in the manufacture of implements. Some workable flint was observed in the vicinity of the ore-body, and flakes and rejectage of blade-making, as well as a number of well-finished spearheads, arrowpoints, and leaf-shaped blades were intermingled in the filling of some of the superficial pits; but this flint-shaping appears to have been an incident only of the work on the site. The evidences of this shaping work are not sufficient to warrant the conclusion that the extensive tunneling was carried on for the purpose of obtaining material for that purpose. Besides, this flint is found in large bodies in many sections of the general region, and could readily be obtained in quantity.

It was observed, in approaching the mine, that the exposed surfaces of the ore and the ground about were everywhere a brilliant red. The workmen were red from head to foot, and anyone venturing to handle the ore soon found his hands smeared with red oxide, repeated washing being required to remove it. The prevalence of the red color suggested at once the idea that the site had been an aboriginal paint mine, and that the red and yellow oxides were mined and carried away to be used as paint — an article of utmost importance in the aboriginal economy.

As the charges of dynamite used by the miners broke down the walls of the mine, it was observed that the deposits were of irregular hardness, that certain portions of the ore were very compact and flinty, containing much quartz, and of dark bluish or purplish hue, while the larger portion was so highly oxidized as to be easily broken up. Extending through the ore body in all directions were

RECENTLY EXPOSED FACE OF AN IRON MINE, SHOWING SECTIONS OF THE ANCIENT GALLERIES

pockets and seams of soft red and yellow oxides, and in places there were irregular openings and partially filled cavities. Two of these openings are shown in plate L, a view of the face of the mine taken by Mr Clark McAdams of St Louis. The miners would drill with great difficulty through the hardest of ore, to have the drill drop suddenly into a cavity of unknown depth. It was difficult to discover just which of these openings and cavities were artificial, or whether or not they had been penetrated by the ancient workers, as changes

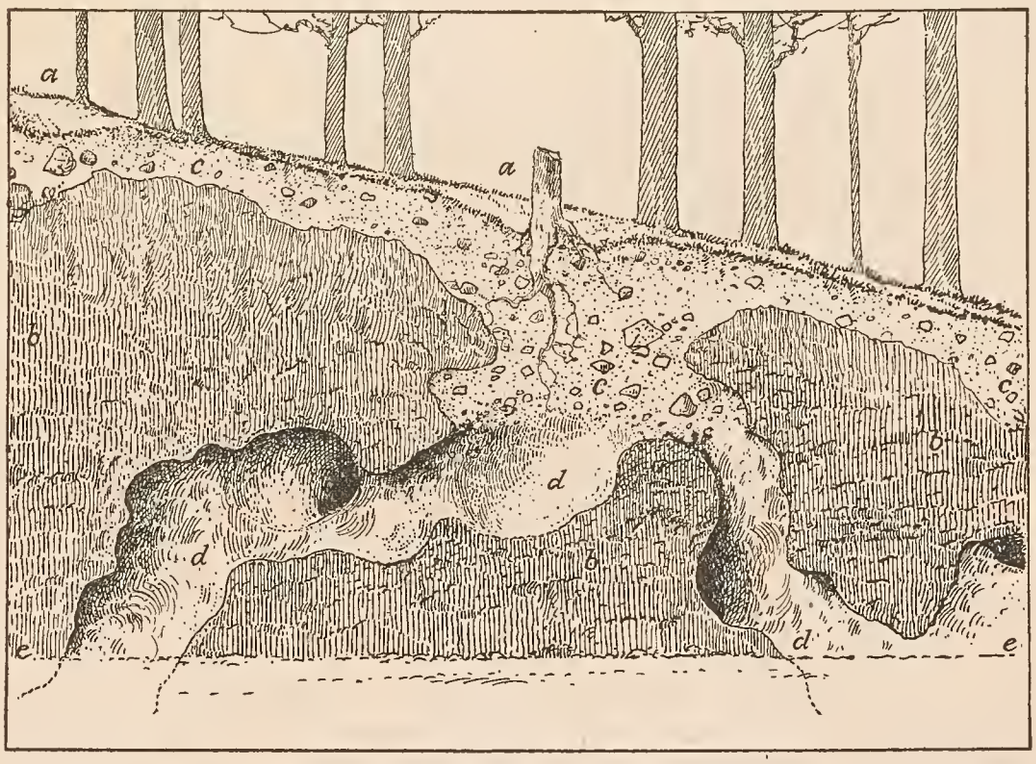


FIG. 30.—Section indicating the manner in which the galleries or borings penetrate the ore-body. (*a*, *a*, Surface traces of ancient pits. *b*, Ore-body. *c*, Filling of excavations. *d*, Borings of the ancient miners. *e*, Floor of mine.)

are constantly taking place in such ore-bodies. Percolating waters fill up or clear out the passage-ways. Generally, however, as the walls were broken down the openings were found to connect with the superficial pittings, as indicated in figure 30.

It appears certain that the larger openings and tunnels in which the sledges were found had been opened up or enlarged by the ancient miners, and that in the search for other bodies of the desired product they had followed weak lines and partially filled passage-ways, removing the projecting masses of hard ore, where these

interfered with the work, by means of the sledges. Sketches of these rude implements are shown in figure 31. It is apparent that the sledges could have had no other function than that of crushing and breaking up the solid masses of ore to be used in the manufacture of implements, or in opening new passage-ways through the ore-body. Although these sledges were made in the main of compact bits of the ore and of the flinty masses associated with it, they correspond very closely in general characteristics with the bowlder sledges used in such great numbers in the copper mines of Lake Superior. Nearly all appear to have been hafted for use, and the

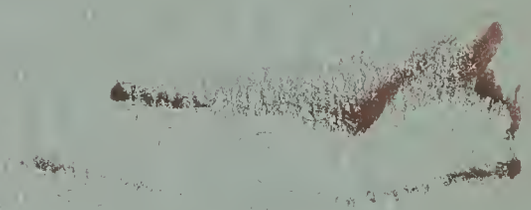
FIG. 31.—Sketches of the rudely shaped mining implements.

majority show the rude grooving or notching necessary for the attachment of the withe haft. It would seem that in the narrow passages of the mine the use of hafted implements would be inconvenient if not entirely impracticable, and we are left to marvel at the feat accomplished of penetrating a compact ore-body in dark, sinuous passages hardly roomy enough to admit the body of a man, with the aid of rude bits of stone held in the hand. The character of these openings is indicated clearly in plate L, which shows the face of the mine as freshly exposed by the mining operations; and figure 30 indicates somewhat imperfectly the manner in which the tunnels or borings penetrate the ore body connecting with the su-

perficial pits and extending to unknown depths beneath the present floor of the mine.

Numerous examples of the implements found and specimens of the ore in its various phases, together with a large mass of the compact ore, one surface of which shows the markings of the mining tools of the aborigines, were presented to the National Museum by the proprietor of the mine, Dr S. W. Cox.

I have now examined mines and quarries of the aborigines in twelve distinct materials, and each new example has added to my former high estimate of the enterprise and perseverance of the native peoples when engaged in the pursuit of their normal industries.



VOLUME VI.

SECTION IV .,ETHNIC LAY FIGURE GROUPS, 1910-16.

make light

LAY FIGURE ETHNIC GROUPS OF THE NATIONAL MUSEUM

(Extracts from an illustrated article (5 groups) in The Sunday Star, August 24, 1913)

(See Annual Reports of Museum)

"The American scientist has proven himself as effectively original as the American of any other calling and his ingenuity came to the front with a scheme for getting these changing peoples on record. This scheme has since been most thoroughly worked out and proved so effective that it is now in use in practically all the great museums of the world.

"This new idea of the American ethnologist was to crystallize into permanent form a family group of all the important peoples. This group should be cast, life size, into some permanent material. The members that go to make up the group should be shown at their customary activities. They should be clad as when seen at home. The scene should be set as though the pages of history were turned back to the time when these people lived untrammeled by a higher civilization and foreshadowed by higher peculiarities of the time and place that they formerly occupied.

"The first of these groups was made and exhibited at the world's fair at Chicago. Dr. William H. Holmes, a curator in the National Museum, originated the idea and developed the groups. Dr. Holmes is a scientist and an artist. He is one of the great men in ethnology in America.

1893-4

He is a specialist upon the placing of ethnological exhibits in a museum. Particularly has he proven himself skillful in the development of aboriginal groups, for here was there an excellent opportunity for a combination of art and science.

- - - -

"In the National Museum today there are some twenty of these groups. Each figure is the size of its counterpart in life. It has first been modeled in clay by a sculptor, who ranked high as an artist, and who worked under the direction of a scientist who knew exactly what he wanted. Each figure is full of life and expression and fits into a group that is engaged in a typical occupation of the tribe. The scene is set in just the surroundings in which the originals lived. They are surrounded by the tools and wear the clothes that were used and worn by the originals. Each group is so vivid and so lifelike that a photograph of it could not be told from a picture from life. These groups, mounted in huge cases, are the exhibits of them all that most please the thousands of visitors that are constantly going to the museum.

"The curator," says Dr. Holmes, "may select only those features in the life of a people susceptible to ready and effective illustration. He can deal with tools, utensils and devices employed in the practice of the arts.

He may show the products of the people's labors where such exist."

* * * *

"After exhaustive investigations the museum finally made two groups of the Indians of the Atlantic seaboard. The first of these represents Capt. John Smith trading with the Indians of Virginia. The details that go into the group are very largely from the John White drawings. It was the trading of John Smith that enabled the settlements to survive famine and retain the first of the British colonies. The historical event and the ethnological correctness of the group make it about the best thing there is in the way of a record of the Virginia Indians.

"There is one other group of eastern Indians which is but recently completed. It is known as the arrow head makers and is illustrative of the manner in which this important aboriginal industry was carried on. On the outskirts of the city of Washington is a quarry that was used by the Indians of the east for centuries in the getting out of arrow heads. The material used is a very hard and flinty boulder and the grade of these found in this particular quarry was better than that to be found elsewhere. It is a well established fact that the Indians for hundreds of miles in all directions came here for their arrow heads. The deposits of the chippings of

these boulders incident to this work are ten and fifteen feet deep and cover many acres. From the tools that have been found, from later information with regard to arrow making and from the John White records of clothing worn by these Indians, a group has been constructed that the scientists regard as showing the industry as it actually existed for centuries where are now being erected the homes of the residents of the Capital city."

* * * *

"When Dr. Holmes came to make up a family group of Eskimo he determined to do what he could toward overcoming the idea that is thoroughly implanted in the public mind that these people of the north are morose and melancholy. The Eskimo, as a matter of fact, is a merry individual, ever ready to laugh. The Eskimo group in the museum shows a young man of the tribe who has been fishing through a hole in the ice and who has caught a small seal. In his enthusiasm he dispatched a runner for a sled to haul home his prize, and the dog sled is brought forth and the family comes along to view the catch. When they arrive the seal is so small that they all laugh heartily at the young fisherman for ordering the sled instead of carrying the seal home on his back. The sculptor has caught most exactly the facial expression of the different members of the party."

* * * *

"The museum intends to make groups of the important South American tribes. So far but one such group has been made, but it is one of the handsomest in the museum. It is of the Patagonian Indians and shows the family in readiness to move. The hunter in his skunk skin cloak, the mother on horseback accumulating the family belongings, the child playing with the pet guanaco, or American ostrich, all are distinctive and all throw a strong light on the exact manner of people who inhabit the other end of the Americas.

"The curators of the museum believe that these groups convey an understanding of the nature of given peoples to the beholders more quickly than any other form of teaching ever devised. They have made these groups in such a way that they should last for centuries before falling into decay and can be copied when that time comes. So will these lifelike reproductions of the peoples of today and yesterday be handed down to the end of time to those that worry along after we, and the tribes modeled, have gone on to the happy hunting ground."

(Copyright, 1913, by W. A. Du Puy)

red cloth

basket of corn.

34. John Smith Trades with the Indians.

(5)

THE ESKIMO GROUP

The following extract from an article published in the Washington POST for March 2, 1902, will suggest the fruition of this and other plans submitted:

"Professor W. H. Holmes has just completed and installed within the National Museum three magnificent ethnological groups portraying, in the most realistic manner, the life of three distinct tribes of aborigines; namely, the Eskimos, of Cape York, Greenland; the gigantic Tuelches, of Tierra del Fuego, South America; and the Mojave Indians, of the mouth of the Colorado River, in Arizona. The figures are placed in large glass cases, and are life size. They were modeled by Prof. Holmes from measurements, photographs, and descriptions gathered by Lieut. Peary, Mr. Hatcher, and Prof. McGee in the regions inhabited by the tribes represented. People who have visited the museum lately are unanimous in pronouncing the Eskimo group the finest work of the kind ever attempted.

"The floor of the last named case is made in imitation of a snow and ice covered lake-front, with a portion of the frozen lake imitated in glass. Beginning at the left of the case is an Eskimo sledge, to which four Eskimo dogs are hitched.

"The skins of these dogs were received direct from Peary, and were stuffed and mounted in the case by the museum taxidermist, who has shown exquisite taste and skill in arranging the animals in natural and life-like attitudes. One of the dogs is asleep, another has his nose on the ground, as though scenting something, while the others, with ears erect, are intently

watching the landing of a seal by an Eskimo on the extreme right. Standing by the sledge is a young Eskimo driver, holding in his right hand one of the long whips used in driving dog teams. The next figure is a man of advanced years carrying a harpoon; then comes a woman with an infant strapped to her back, a boy about ten years of age, and a young man who has just harpooned a seal through the ice and is dragging it to shore.

"Eskimos Are Merry

"The clothing, weapons, and utensils worn and in the hands of the figures of this group were collected in Greenland by Peary, so that everything is true to the life represented. Every figure in the group except the young man who has caught the seal is laughing. Prof. Holmes has modeled the figures to represent a group convulsed with laughter over a mishap which has befallen the one with the seal. Speaking of this Prof. Holmes said:

"'By some means the false notion has gained ground that the Eskimos are a morose, gloomy, and dismal people as a result of the rigors of their inhospitable climate and surroundings. This is a great mistake, for, on the contrary, they are the most cheerful and mirth-loving people you ever saw. In this group I have endeavored to give a truthful representation of the Eskimo as he is. Those on the bank are laughing over the mishap that has befallen the seal hunter on the ice below.'

"The group of Tuelches is, from a scientific standpoint, more interesting even than the one just described. The Tuelches, inhabiting the southern extremity of Patagonia, Tierra del Fuego,

and the country around Cape Horn, are the tallest people in the world, the average height of the men being seven feet. The material for the group was collected under Prof. Holmes' directions by Mr. Hatcher, who made a journey to this out of the way corner of the world, spending about a year among the natives. The group shows a young man about seven feet tall, with a robe of skins thrown about his shoulders and a "bolas" in his right hand. A stuffed and mounted piebald pony of the breed found all over the pampas, stands in the center of the case. Mounted on the pony is a squaw, receiving a bundle of guanaco skins from a little girl who is handing them up to her. A few feet beyond is a cradle containing a papoose; near by a young girl is engaged in wrapping up a bundle of blankets and guanaco skins, while a boy about twelve years of age stands on the extreme right, in the act of teasing a rhea, or South American ostrich. Prof. Holmes has depicted the savages in this group in the act of moving or breaking camp.

"The group of Mojave Indians is also interesting. It shows a camp scene with one of the old warriors teaching the young boys how to use the bow and arrow, while women and girls are pounding corn, making tortillas, and performing other household functions.

"So lifelike are these groups that children visiting the museum with their parents invariably steer clear of the case containing the Eskimo group, thinking the wolfish-looking dogs are alive."

35. The Completed Eskimo Family Group.

Aboriginal Life Reproduced at the Pan-American.

aug 1901

A PART OF THE EXHIBIT OF THE DEPARTMENT OF ANTHROPOLOGY OF THE NATIONAL MUSEUM, WHICH DAILY DELIGHTS THOUSANDS OF VISITORS IN THE UNITED STATES GOVERNMENT BUILDING AT THE EXPOSITION.

ILLUSTRATED FROM PHOTOGRAPHS BY FRANCES B. JOHNSTON.

By special courtesy of the United States Government Board.

Buffalo Express

Near the middle of the main Government building at the Pan-American Exposition, there stand some figures which no visitor is able to pass without looking at. They are the figures of Indians, grouped in big glass cases. They arc of life size, and each group gives the impression of an Indian family suddenly stiffened and made immobile in the midst of its work and play, with the colors of life unchanged, and with all the implements of its daily occupations scattered about. It is like the palace of the Sleeping Beauty; life is there without movement. Around the cases, all day long, eddies a curious throng. The blanketed redskin from the Indian village, and the spectacled man from Boston, the woman in the shirt waist and the trim soldier, elbow each other and look into the cases. All alike understand the spectacle and enjoy it; it is science made easy.

The groups are a portion of the exhibit of the department of anthropology of the National Museum. The department has other exhibits in other places, including some lent to the Ethnology building, but here, beside the departments of biology and geology in the section of the Government building devoted to the Smithsonian Institution and the Museum, it has its chief exhibit. These groups portray representative types of the American aborigines.

The department of anthropology of the National Museum had six months in which to prepare its exhibit for the Pan-American. The nature of the exhibit was easily fixed upon. The display, it was decided, should give an idea of the life and arts of the aborigines of the Western Continent. It was planned, therefore, to form groups of typical Indians, and so arrange them that by passing through the exhibit from north to south or from south to north, a consecutive view would be obtained of the Indians of the Three Americas. So Curator William H. Holmes of the department of anthropology went to work on these figures. But the time was very short. Much of the material was on hand, but some of the costumes needed, particularly those of women and children, were not possessed by the Museum. Four expeditions were sent out to gather the missing material, among them two to Brazil, but only one of the four got back in time for the exposition. There was not time to finish all the groups, too, in the size planned. Two of them, those for the Eastern Esquimaux and the Patagonian Indians, are in cases eight feet by twelve, but the others are smaller. In three of the cases the groups are not represented in typical occupations, but are merely standing figures. When the groups are prepared for their final destination in the National Museum, changes will therefore be made so as to bring them all to the dimensions of the original plan. But as it is, they are such groups as have never been seen before. Ordinarily, in the museums, one sees one or two figures, perhaps the adult male and female, as representatives of the tribe; but here one sees the whole family, engaged in typical occupations.

Most people who look upon these figures think that they are made of wax. Their perfection and their lifelike colors give this idea. But in reality they are plaster casts, colored like life. Clay models were prepared by sculptors under the direction of Curator Holmes. His direction to the sculptors was to represent the physical characteristics of the people under consideration, but not to reproduce the masks and casts taken from individuals, which necessarily presented a view of the subject different from natural conditions. He himself had to furnish many of the racial characteristics. Built up in this way, the groups possess both artistic qualities and a likeness to life which impress even the careless observer. From the clay models casts were taken, and suitably costumed and mounted, and the result is seen in these groups. It may be added that these casts are the only ones which were made. Visitors to the Pan-American Exposition, therefore, see something here that was never seen before.

One of the new ideas carried out in these groups is the taking of the family as the basis of the exhibit. It was felt that the unit for illustrating the peoples should be family groups, of men, women and children, with costumes, personal adornments and general belongings. There are from four to seven figures of human beings in the larger groups, and three in those wherein are only standing figures. In some of the groups there are animals as well as human beings; the horse and the native ostrich in the Patagonian group, and several dogs in one of the Esquimau groups.

The purpose at the base of the exhibit was, as remarked, to give a general view of typical groups of the aborigines from one end of the continent to the other.

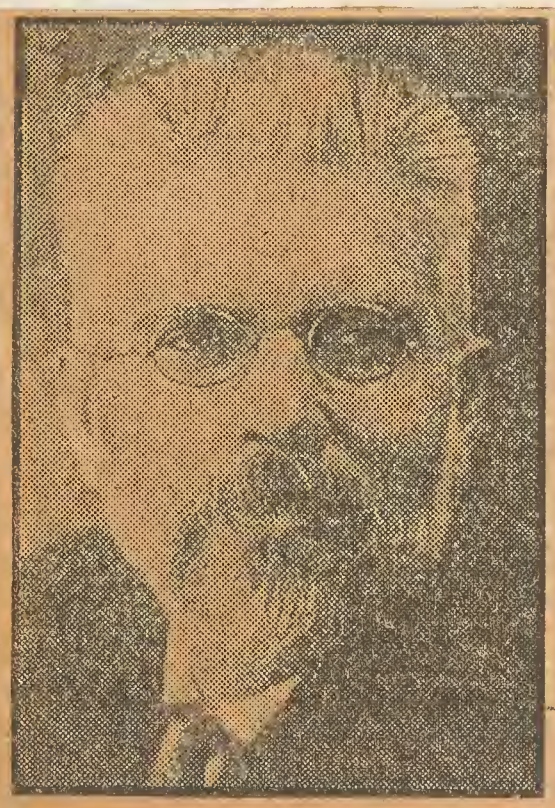
Sloan

MODELS OF A FAMILY GROUP OF INDIANS.

During the past several months Mr. Dunbar has modeled fifteen figures, ten of which were of Indians. Where Mr. Dunbar used a live model he followed the facial expressions assumed by the Indian. In the other instances, however, he has, for example, taken an illustration containing ten or more Samoan women. From this he has chosen the desired attitude, and from two or three the expressions, which he molds into one composite whole. Mr. Dunbar will shortly begin modeling another Samoan woman sitting cross-legged making "kavi," a native drink, obtained by squeezing the juice from a native fruit. The group will show the woman sitting before a bowl holding the fruit.

All the figures have to be passed upon by Dr. Holmes, as it is he who designs the groups, and from his study of the various races of man chooses the attitudes and occupations which are most characteristic of the people and place to be represented.

The model after it leaves Mr. Dunbar's hands then travels across the hall and is treated by Mr. Palmer. First a thin coating of bluish plaster is applied, over which is poured the regular plaster of paris. On account of the tin, the plaster is prevented from covering the figure as a whole but is in several parts, which, when the plaster has hardened, can be removed without danger either to them or to the cast. After this operation, unless another cast is desired, the model is no longer necessary. The cast thoroughly hardened is first washed off to rid it of the reddish color obtained from the clay.



U. S. J. DUNBAR,
Who Models Figures at the Museum.

Models selected by Powell and executed by WWH

Evening Star
January 14, 1912.

rising at the back and part of a stone structure at one end. Moss and other plants are to be seen, while on a huge bowlder behind one of the sitting Indian figures lies a feather and piece of deer hide, such as the occupant might have laid aside for future use. It is these details which add the last finishing touch of realism to the combined work of all those who have been connected with it. Mr. Hendley too, has charge of much of this work, subject to the approval, of course, of Dr. Holmes, who throughout the whole process keeps in close touch, in order that it may be just as he desires.

ABORIGINE GROUPS IN LIFELIKE POSE BY SCIENCE.

Eskimos Seen at the National Museum, with Patagonia Giants and Mojave Indians, with Fidelity to Nature.

Professor W. H. Holmes has just completed and installed within the National Museum at Washington three magnificent ethnological groups portraying, in realistic manner, the life of three distinct tribes of aboriginies—the Eskimos, of Cape York, Greenland; the gigantic Tuelches, of Tierra del Fuego, South America; and the Mojave Indians, of the mouth of the Colorado River in Arizona. The figures are life size. They are modelled by Professor Holmes from measurements, photographs and descriptions gathered by Robert E. Peary, Mr. Hatcher and Professor McGee in the regions inhabited by the tribes represented. The Eskimo group is the finest work of the kind ever attempted.

The floor of this case is made in imitation of a snow and ice-covered lake front, with a portion of the frozen lake imitated in glass. Beginning at the left of the case is an Eskimo sledge, to which four Eskimo dogs are hitched.

The skins of these dogs were received from Peary, and were stuffed and mounted in the case by the museum taxidermist, who has shown taste and skill in arranging the animals in natural and life-like attitudes. One of the dogs is asleep, another has his nose on the ground, as though scenting something, while the others, with ears erect, are intently watching the landing of a seal by an Eskimo on the extreme right. Standing by the sledge is a young Eskimo driver, holding in his right hand one of the long whips used in driving dog teams. The next figure is a man of advanced years carrying a harpoon; then comes a woman with an infant strapped to her back, a boy about ten years of age, and a young man who has just harpooned a seal through the ice and is dragging it to shore.

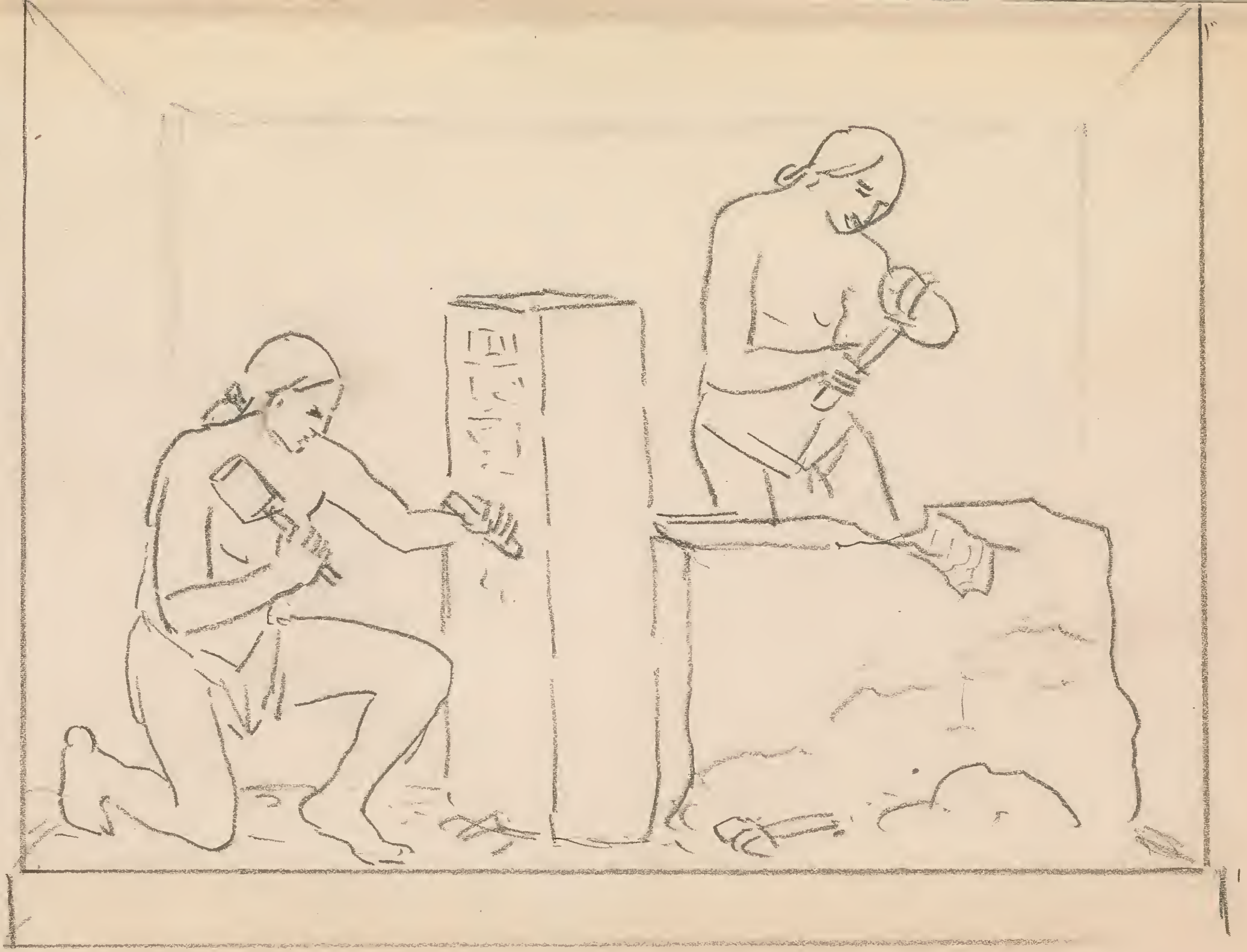
The clothing, weapons and utensils worn and in the hands of the figures of this group were collected in Greenland by Peary, so that everything is true to the life represented. Every figure in the group except the young man who has caught the seal is laughing. Prof. Holmes has modeled the figures to represent a group convulsed with laughter over a mishap that has befallen the one with the seal. Speaking of this, Prof. Holmes said:

"By some means the false notion has gained ground that the Eskimos are a morose, gloomy and dismal people as a result of the rigors of their inhospitable climate and surroundings. This is a great mistake, for, on the contrary, they are the most cheerful and mirth-loving people you ever saw. In this group I have endeavored to give a truthful representation of the Eskimo as he is. Those on the bank are laughing over the mishap that has befallen the seal hunter on the ice below."

The group of Tuelches is scientifically more interesting than the one just described. The Tuelches, inhabiting the southern extremity of Patagonia, Tierra del Fuego, and the country around Cape Horn, are the tallest people in the world, the average height of the men being seven feet. The material for the group was collected under Prof. Holmes's directions by Mr. Hatcher, who made a journey to this out of the way corner of the world, spending about a year among the natives. The group shows a young man about seven feet tall, with a robe of skins thrown about his shoulders and a "bolas" in his right hand. A stuffed and mounted piebald pony of the breed found all over the pampas, stands in the centre of the case. Mounted on the pony is a squaw, receiving a bundle of guanaco skins from a little girl who is handing them up to her. A few feet beyond is a cradle containing a papoose; near by a young girl is engaged in wrapping up a bundle of blankets and guanaco skins, while a boy about twelve years of age stands on the extreme right, in the act of teasing a rhea, or South American ostrich. Prof. Holmes has depicted the savages in this group in the act of moving or breaking camp.

The group of Mojave Indians shows a camp scene, with one of the old warriors teaching the young boys how to use the bow and arrow, while women and girls are pounding corn, making tortillas, and performing other household functions.

36. The Cocopa Family Group.



37 Preparatory Sketch for the Maya Sculpture Group.

QUARRY-MINE GROUPS FOR THE SAN DIEGO EXPOSITION.

STONE WORKING AT MITLA.

This group is designed to show two men in simple workman's costume, the one standing, leaning forward over a large block of trachyte in the act of cutting the stone into two parts with a hafted stone pick; the other is to be resting on one knee, with a stone pick or chisel and mallet, carving a design on one end of the same stone which is being cut in two by the other. The group does not need to contain more than the two workmen and the large stone which should be 5 or 6 feet long by 3 or 4 feet in other dimensions. Also, there should be a piece of earthenware for water a basket for food,and some additional tools.

MAYA

THE STONE CUTTING CARVING GROUP.

The man standing is in the act of cutting in two a large squarish block of rock well smoothed on the top and part of the sides. The figure requires: a wig, stone pick, gee string (colored goods).

The other figure is engaged in carving a block of stone placed on the end of the larger block using a mallet and chisel. In order that he mak work on this block he should be raised a foot or more from the ground which may have an approximately regular surface. The height of the large rock should be three feet, length 5 feet, width 3 feet xxx more or less. The block being carved may be 3 ft. high b 1½ feet square or two feet one way and 8 inches the other. It shoul be an object partly carved only. This figure requires the usual wig and gee string.

38. The Aztec Obsidian Workers.

Proofs illustrating the working
of obstruction and the great number of
problems solved by the author

THE COPPER MINE GROUP.

Miner with stone sledge on level of floor facing inward from the right end. Requires: hafted sledge, wig - hair free or tied up according to instructions (?) - ordinary gee string of stained buckskin.

Implement maker sits on the edge of the pit in which the miner works, two or three feet above the level of the floor, the raised space extending across one-third of the case and faced with irregular, rough stone from which the miner is breaking out a bit of copper. The rock will be gray, mottled rock rather dark of volcanic ~~as to kind~~. The face of the pit might show more than one bit of protruding copper irregular in shape fixed still in the rock. The workman should have by him nuggets of copper. He shapes an implement - a knife or adz using a large smooth bowlder as an anvil, this bowlder being of blackish rock. The implement is held in the left hand and on the anvil and his right hand holds the bowlder hammer ~~which is not yet made.~~

Accessaries required:

Basket to hold implements, and bits of copper.

Two or three extra sledge hammers should lie about in case, some hafted and some without hafts.

Implements — Cut
Copper implement being worked —
Wrist — Cut
L. Shank — Cut
Necklace — ?
Extra Tools — ?

(28)

Copper head

36"

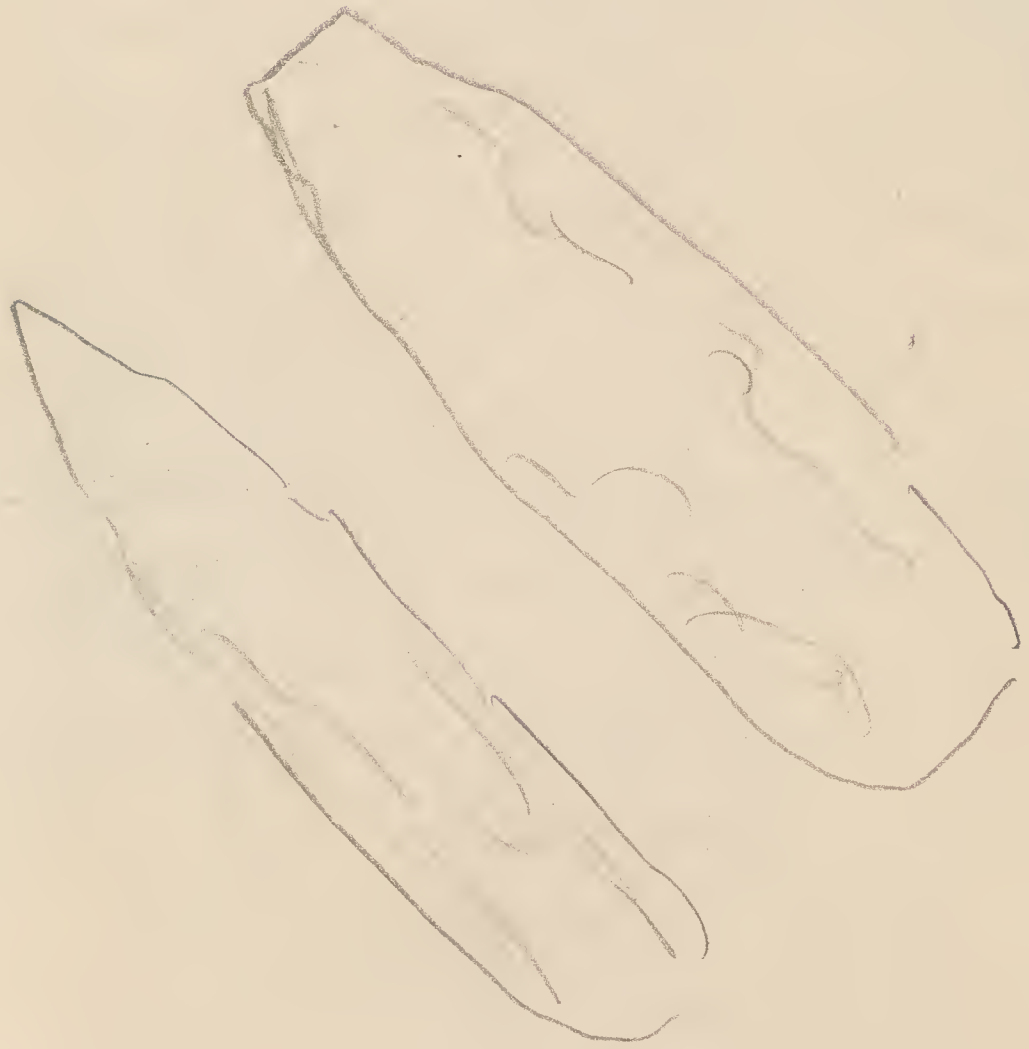
32

3 feet

flat ground plan

39. Preparatory Sketch for the Copper Mining Group.
by ZHA.

Flint Ridge



SCIENCE SERVICE RADIO TALKS

PRESENTED OVER THE COLUMBIA BROADCASTING SYSTEM

THE INDIANS OF THE DISTRICT OF COLUMBIA

By Dr. WALTER HOUGH

HEAD CURATOR, DEPARTMENT OF ANTHROPOLOGY, U. S. NATIONAL MUSEUM

THERE are many evidences that before the coming of the white man Indians had their villages in what is now the District of Columbia. These Indians spoke the language of the great Algonquian family which covered the east coast, and for this reason the Algonquians were met by John Smith at Jamestown and by the Pilgrims at Plymouth. Much more is known about the Virginia Indians than of the northeastern tribes seen by Winthrop, because Sir Walter Raleigh sent along with John Smith a competent artist who drew pictures of the natives, their houses, dances, occupations, and of animals of the sea and land. Accustomed as we are to the buckskin of the western Indians, we will be surprised to know that Powhatan's braves had nary a shirt to their backs, robes taking their place. The women wore short skirts and the children dispensed with clothes. Of course, in the cold months of winter the Indians withdrew into their houses and enjoyed the stores of corn, smoked fish, hickory nuts and such things as they had laid up. The houses were of bent poles covered with mats and were in shape like a hayrick seen on farms.

Such houses were spaced with some regularity into villages, surrounded by cornfields, and having a dance plaza smoothed by the bare feet of the celebrants around the central fire. Secotan was a scattered village among the trees, while Pomeioc was massed in a circular palisade of sharpened stakes. John White made pictures of these towns and they may be regarded as typical Algonquian architecture and village planning. We may thus restore to the mind's eye a great village on the Eastern Branch and call it the ancient capital of this region.

It may seem unfortunate that the District of Columbia Indians left so few traces of their life here. Archeologists trained to the work are able to see much in small things and to tell the story without straining the imagination. One picks up an arrowhead, say, at Anacostia. It is of a certain stone and worked from a boulder most likely at the Piney Branch quarry. He knows that the arrow was fixed with sinew at the end of a wooden shaft, straight and smooth, which was notched at the end to receive the string; also that it was feathered to guide its flight.

He knows further that there was a bow to project the arrow and that it had a sinew or Indian hemp cord. Then it is evident that there was a man in charge of the bow, arrow, quiver, and so forth. The arrowhead was found at Anacostia, inhabited by the Nacotchtank Indians, and we have got our man, equipped for the hunt or battle. The arrowhead was found at Anacostia and belonged there because it is the right kind of stone. Another variety of stone would indicate that it was a point made by the hostile Indians living on the Susquehanna or where the certain stone was found. Perhaps the archeologist picked up a fragment of pottery and derived a most interesting story from it. Especially it would tell him that the Indians lived in a village of houses because fragile pottery can not stand rough Indian transportation, and was therefore made on the spot from native clay.

So the story widens with the bits of

the old times picked up, everything having an Indian man or woman once living and breathing at the other end. The hunt for the Indians is not made with a spade and the fingers, but with the informed mind. The District of Columbia Indians were in the stone age, and imperishable stone tools left in the soil are silent though eloquent of the old times. So many of the implements are of a stone called quartzite that archeologists earnestly desired to know what was the source. Dr. W. H. Holmes and De Lancey Gill, archeologically sleuthing here and there over the District, found quartzite boulder beds in the once beautiful valley of Piney Branch and saw chips and partially worked cobble stones lying about. Here, said Dr. Holmes, appears to be the quarry. Subsequent ditching revealed that here was one of the greatest Indian quarries discovered in the United States.

Thousands of tons of chips and other quarry refuse lay under the tree-covered gentle slopes of Piney. Dr. Holmes' trenches showed that the boulder bed had been worked in places to the depth of 28 feet. An incredible amount of labor had been expended here to fashion by blows of stone upon stone leaf-shaped blades, the blanks from which arrowheads and knives were made in far-off camps. In the old days of the District of Columbia a temporary camp of mat houses would be seen on the level tract of Blagden's, above the quarry. This village site was discovered by the speaker when the war garden bared the soil undisturbed by the plow for more than a century.

The river life of the Potomac in 1608 must have been very interesting. John Smith tells of divers savages in canoes, well laden with the flesh of bears, deer and other beasts. Some of these dug-out canoes are in the Potomac mud no doubt now. There were many places to paddle not open to-day. Boats could move about freely where the new government buildings are going up, and the Eastern Branch was a great river 300 years ago. At night, reflected in the undulating Potomac, were the lights of the torches of fishermen, and over the smouldering fires of the primitive gridirons the catch was smoked for the winter. Down the river and around the coast went canoes filled with furs, meat and corn for aboriginal trade.

Land trails also centered in the District, leading to the Susquehanna and on to the West. Braddock used an old trail to Cumberland worn deeply in old times by Indians in moccasins. Railroads must follow these old trails in another day, giving little thanks to the native road builders. Sometimes among the débris of lost villages one comes upon a bit of fashioned soapstone, a shard of an ancient vessel. Thin, smooth and well formed, this bit shows the skill of the Indians of the District of Columbia. Not satisfied with determining the size and shape of a soapstone pot from a fragment, Dr. Holmes sought out the places where the Indians quarried soapstone, finding several small quarries in the District where they had worked. The story could not be completed here, but in a quarry in the old District towards Alexandria he found bosses of soapstone worked out on the face of a deposit. The bosses were the round bottoms of future soapstone pots, the next step being to knock these bosses off and excavate them with the rude pick chisels of stone left about by the workers. Thus lightened, the unfinished pots were carried to the camps and finished to the taste of the cooks who had use for them.

In its natural conditions or only slightly aware of the presence of man, the District must have been an ideal place for savage life. Every family could have a deer a day and not decrease the herd; a bear once in a while, wild turkey, water birds, fish, roasting ears and ripe corn would vary the fare. Not too thickly planted by nature for the

tablishment of their lines accurately upon the time signals broadcast from the observatory? To show you how extensive is the use of our time signal, in 1921 the Naval Observatory broadcasted a special time signal upon the request of the Australian Boundary Commission,

ing telescope. At that time it was the largest one in this country.

Having given you this brief history of the U. S. Naval Observatory, the place where the time is kept, and the place which tells the time to the nation, I will now briefly describe how we calculate

Radio talk for Science Service Feb. 20th 1931.

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The coming of the white man to Jamestown in 1607 was a small entering wedge into a vast territory and perhaps we would think it of little effect on the District. On the contrary, in 75 years there was not an Indian left in the valley of the Potomac, the same story that became old as the white man pushed the remainders west. The District was settled by hardy pioneers and a new line of history began.

Science and Discovery

CAUSES OF THE TRIUMPH OF HUMBUG IN ARCHEOLOGY

MUCH of what goes by the name of archeology, especially in this country, is a hodgepodge of delusion, misinformation and humbug. The field is exploited by the pseudo-scientist, the unbalanced amateur, the enthusiast for this theory or that. The result is that most of us cherish ill-digested tissues of mistakes on such subjects as prehistoric man, the aboriginal races of America and the character of the civilizations that flourished in the western hemisphere prior to the arrival of the white man with Columbus. These errors ramify in all directions, especially into "sociology" and geology, besides affording various incompetent individuals opportunities for the exploitation of themselves as serious scientists.

This melancholy state of affairs is due in large part, declares Doctor William H. Holmes, in his work on American aboriginals, issued by the Smithsonian Institution, to the sheer multitude of the sources of misinformation. These comprise, referring especially to America, the misinterpretations and errors embodied in four centuries of literature, among which are the imperfect observations and erroneous deductions of amateurs and the inept. Especially to be deprecated are the utilization of this class of observations by enthusiastic supporters of vague theories and preconceived views, and the demand for sensational matter by the newspapers. It would seem as if the newspapers of our time were among the worst offenders in their ready acceptance of whatever is sensational in the way of an archeological "find," without reference to the soundness of the inferences based upon it.

"The diversity of invented and exaggerated statements which find currency is, indeed, appalling. The world hears constantly of the discovery of skeletons of giants and of pygmies; of caverns filled with mummified bodies and rich plunder; of ruined cities abounding in marvelous works of art; of hardened copper; of walls and buildings of astonishing magnitude; of sunken continents; of ancient races associated with extinct species of animals; of inscribed tablets of doubtful origin and extraordinary import; of low-browed crania attributed to prehistoric races but which are mere local variations or pathological freaks; of fossil bones of animals parading as the bones of man; of reputed petrified human bodies which, on inspection, turn out to be of modern cement; of faked pottery, metal work and the like, so well wrought and so insidiously brought to the attention of scholars as to have become in certain instances the types of antiquity; of learned readings of undecipherable inscriptions; and of the remains of man and his culture from formations of all ages, dating from the present back to the Carboniferous age. The output is so great and the public mind so receptive to error that the tide of misinformation keeps steadily on, hardly reduced in bulk by the never-ceasing efforts of science. The compilations of a Bancroft, a Winsor or a Fiske, illumined as they are by exceptional genius, could not always rise above the vitiated records upon which they drew; and our best authorities in many cases are subject to the danger of combining the original errors into new fictions so compounded and difficult of analysis as to elude the vigilance even of the critical scientific world."

From the first, potent agencies of error have conspired to obscure the aboriginal record. The attitude of the propaganda of Christianity at the period of the dis-

covery of America was such that the first impulse of the Spanish conquerors was to destroy at once all traces of the native religion. A vast number of important sculptures, or "idols," of the people were mutilated or broken to fragments, and the native books and paintings, the treasures of native art and learning, were ruthlessly destroyed. The accumulation of knowledge in this field is therefore difficult and progress slow. The pioneers are not to be blamed for the propagation of the first errors of judgment; but the persistence of certain fallacies is amazing. The cloud over archeology is not wholly lifted from the popular mind, which seems prone, perhaps from lo[illegible], to find error more fascinating t[illegible] truth:

"Among the fallacies which early took hold of the popular mind, appearing everywhere in the older literature, are those of the presence in America of civilized pre-Indian populations. The mound-builders, so-called, were supposed to have reached a high stage of culture and to have disappeared completely as a race, a conclusion reached after superficial examination of the monumental remains of the Mississippi Valley. This idea has held with great tenacity, notwithstanding the facts that many articles of European provenance are found in the mounds as original inclusions, indicating continuance of construction into post-Columbian times, and that the aborigines in various parts of the American Continent, as in Mexico, Central America and Peru, when first encountered by the Spanish invaders, were occupying a culture stage far in advance of anything suggested by the antiquities of the Mississippi Valley.

"A fallacy similar to that regarding the mound-builders fastened itself upon the ancient cliff-dwellers of the arid region when traces of their interesting culture first came to light, but more recent investigation has shown that the ancient occupants of the region who built and dug their dwellings in the cliffs were in general the immediate ancestors of the Pueblo tribes which occupy the same region to-day.

"Speculation has ever been rife regarding the origin of the aborigines, and supposed significant analogies have been made out with nearly every race and people of the Old World. A favorite theory of the earlier students of the subject regarded them as descendants of the lost tribes of Israel,' and as a result, oddly enough, literature has been enriched by the publication of several valuable works on the habits and characteristics of the Indians, written with the view of establishing identities between the two races—works which otherwise would never have existed. Perhaps the most important of these works are Adair's 'History of the North American Indians' (1775), and Lord Kingsborough's 'Mexican Antiquities' (1830–48).

"The myth of Welsh settlement in North America has also been very persistent, descendants of a colony reputed to have been founded by Prince Madoc about 1170 having been identified, mainly on linguistic analogies, with numerous tribes, including the Tuscarora, the Mandan, the Hopi and the Modoc."

The literature of middle and southern America records many attempts to identify the native tribes with foreign peoples, the misconceptions beginning with the belief of Columbus that the people of the New World were identical with those of Cathay. A mythical Atlantis has had a large share in the theoretical peopling of the western world. The laborious compilations of Donnelly, tho marshaling all available facts and suggestive culture analogies, fail to give this latter myth a scientific standing. The fascination of these misconceptions is well illustrated by the recent elaborate and costly staging of a play which embodied, not unknowingly, most of the errors regarding our aborigines which our men of science have been combating for years. Fortunately the play had but a short run.

Among the varied misconceptions embodied in our literature is the belief that the native culture had reached before the Columbian discovery its highest development and had given way to a period of general decline, conforming thus with the fate of certain Old-World civilizations. Altho fully promulgated, this theory by no means conforms with the facts with regard to the race as a whole. Doubtless, some advanced groups, such as the Maya, had reached a climax of progress and had retrograded. Still, it would be difficult to prove that any of these cultures, represented as they are by important achievements, were, on the whole, greatly superior to the culture achievements of the Aztec or the Incas at the period of the discovery.

VOLUME VI

Section V. Pitfalls of the Paleolithic Theory.

August. 1922
Prepared to be read by
Dr Hrdlicka at the Brazil
meeting (Rio) + so read
MHH

Pitfalls of the Paleolithic Theory in America.

The history of the human race, its evolution and the development of its culture are matters of great and lasting interest, and there remain still many problems unsolved. The earliest traces of man's presence are found in Europe and consist in large part of rudely chipped implements of stone, the period being referred to as the Early Stone, or Paleolithic, Age.

Early students of man in America found corresponding traces in chipped stone widely distributed, and reached the conclusion that man's history corresponded closely in the two continents in character and in time, and this view was recorded and promulgated in an extensive literature and illustrated by large collections of artifacts in our Museums.

Later, some thirty or forty years ago, consideration of the American evidence began in earnest and attention was given to its character, and very especially to the artifacts involved—

to their place in time and in the culture scale, scientific methods being for the first time adequately applied to the research. Fortunately the stone age with the American aboringines had not yet fully passed and a study of the stone shaping arts of the Indian tribes, present and past, vigorously prosecuted, threw much light upon the subject. The work of manufacture was given particular attention and most important determinations were made. Long practice of the shaping processes made it clear that for each ordinary chipped implement produced, numerous partially shaped failures resulted, which failures were left on the chipping sites, generally the sites of the raw material.

In the eastern United States extensive use was made of water-worn stones, pebbles and boulders, in the manufacture of implements, selected boulders being used as chipping hammers. The shops were located largely along the margins of outcrops of glacial and post-glacial formations where the water-worn stones occur in great plenty, and it is along these outcrops that the rudely chipped failures or rejects of the Indian implement-maker

were left and are found. The successful forms, completed or tested as to the workable qualities of the material, were carried away to be applied to their appropriate uses or to be finished at leisure. This resulted in general in a separation of the two classes of chipped stones; the rude rejected forms resulting from imperfect fracture and very generally from too great thickness, a thin blade being the principal form desired, were left on the shaping sites and these with the passing of time were often deeply buried through changes in the loosely bedded deposits; while the accepted forms were removed to the village sites to be finished and used. Here we have the root of the first ~~great misunderstanding~~. As a result of the conditions described, our early and inexperienced collectors, not appreciating the real conditions ~~thus indicated~~, reached the conclusion that the rude rejected forms belonged as original inclusions in, or had been weathered out of, the exposed margins of the ~~pebble and boulder-bearing~~ deposits where they ~~had been~~ were found. The observation that these rudely chipped forms correspond in simplicity and general type of form with the "stone implements"

(chipped stones) of Europe, there classified as Paleolithic, confirmed this interpretation and led to the adoption of the vital error that a quarter of a century has not fully eradicated.

The degree of success of the chipping work varies with the nature of the material. When it is bad there are numerous failures, when it is good comparatively few. In the upper gravel terraces on which the city of Washington is built, for example, not one boulder or pebble in fifty is of workable quality, and failures, should work be undertaken there, would be very numerous; while in the northern suburb of the city the ~~quartzite~~ boulders lend themselves somewhat readily to the chipping hammer, failures in skilled hands being perhaps not more than twenty or thirty to one success. The chipping refuse of the Indian work on one of these sites was found to be 5 feet in depth, there not being in the tens of thousands of chipped forms a single one that would not have been classed as paleolithic ih the near past.

Thirty-~~five~~ years ago a large numbers of chipped objects

from these and other local sites were assembled in our National Museum and labelled by the Curator as of glacial age and as representing American paleolithic culture. They were also exchanged with other museums where they were associated with similar rejects of manufacture from other localities and correspondingly labelled. At this period this was not seriously questioned, having the support of most of the foremost students of Antiquity ~~in America~~ at home and abroad.

In the U. S. National Museum may be seen the contents of a Pennsylvania cache or deposit of beautifully shaped blades of argillite numbering 5,000, and by reasonable estimate, based on long experience of the present writer there exist today on the sites of the raw material scattered over the hills and valleys of Pennsylvania, not less than 80,000 rejects of the chipping work any of which thirty years ago would have run the risk of being collected and treasured as paleolithic implements by the devotees of the theory of an American paleolithic man.

In recent years very serious doubts were raised by the

present writer and others regarding the correctness of the prevailing view, but the strongly entrenched earlier interpretations were not easily displaced. It appears that some European anthropologists have failed to appreciate the necessity of revising their early impressions, and there is a suspicion that the shadow of early misconception still hangs over European appreciation of the relation of shape to antiquity. Proof of their reliance on mere rudeness of shape to determine age and culture is found in the very conservative attitude of A. H. Keane who, in his book "Ethnology" republished as paleolithic certain of ~~my~~ implements - the present writers illustrations of quartzite boulder rejects from workshops in the District of Columbia, which shops were doubtless occupied by the Algonquian Indians possibly not more than four hundred years ago. Mr. Keane was apparently unable to free himself from the strongly entrenched prejudice in favor of the connection of rudeness of work and simplicity of form with geological antiquity. Today the opposing view very generally prevails, and the present writer does not hesitate to affirm that up to the present time no shaped stone has been found in America

that on account of its shape offers the least support to the theory of an American paleolithic man; and that no shaped stone of any kind yet found in America has any reason for assigment on account of its shape to any other people that the American aborigines of recent geological time. The conservative attitude of Keane is still shared by some other European students who, hampered by the shadow of early misconceptions, fail to give due consideration to the American evidence as it stands today, and it seems not improbable that the shadow hangs also over some features of the problems of early man in Europe.

B A second consideration of primary importance is that of the age of the American occupation as indicated by association of traces of man with geological formations of determined age. That the race reached the human status in the old world at a date geologically ancient is fully established, and there are those who believe also that the race occupied the American Continent at a period equally remote, and there are a few who hold the view that still earlier traces have been found. We are led, however, to

consider the improbability of extended continental occupation, much less of world occupation by a primitive race doubtless not yet master of a wide range of environmental conditions, and we are fully justified in requiring that proofs of such world occupation of the highest order be furnished. Meager and uncertain traces of American occupation of the early periods as compared with those of the old world warrant the closest scrutiny of every alleged proof. Insistence of this requirement is justified by the facts; first, (1920)
that up to the present time we have no absolute assurance that the two continents were, in the early human periods, so intimately connected that primitive peoples could pass from the one to the other; second, that the earlier work in this field of research has been largely by students not well qualified to consider the geological problems involved. In Europe, prolonged research has shown that there are certain types of artifacts associated with particular formations and periods. No such result has been reached in America, and the assignment of any object of human workmanship to a period earlier than the recent must depend solely on its re-

lation with to a geological formation of fully determined age. This is the only question to be asked and answered, and it may be said that the answers which forty 30 years ago were practically all in the affirmative are today very largely in the negative.

It is essential in considering the discovery of any work of human hands thought to be associated with formations of a particular geological period, that three questions be asked and answered: 1st, is the specimen a work of art; 2nd, is the age of the formation involved determined beyond the possibility of doubt; 3rd, is the specimen without question an original inclusion in the particular formation? These questions have as a rule been readily answered by the finders, who have had very imperfect understanding of the requirements of scientific research. There may have been no difficulty in deciding that the object found is a ~~the~~ work of art, but the finder has been without definite knowledge regarding the age of the containing formation and has had little idea of the dangers of disturbance by man and nature of the deposits of all ages during the ~~long~~ period, long or short, that has passed since their deposition.

It is necessary also to consider the possible disturbance of portions of the formation by the hand of man. Judgment has been vitiated also by the fact that as a rule the collectors were enthusiasts who confidently expected confirmation of their preconceived views and hence required no verification but the finding of the specimen in more or less intimate association with the particular formation.

It is especially noted that the 2nd and 3rd questions can be safely answered only by a geologist whose acquirements are of a high order. He should know the problems of the formation as well as the pitfalls of the evidence. He should know the age of the stratum or deposit with which the specimen is associated. He should know the dangers of disturbance and recent intrusion and should by examination of conditions determine that the particular formation has never been disturbed at the particular spot. So great is the danger that he should personally examine the particular association, should see the impression of the object removed, if indeed he has not himself removed it. He should be without bias

for or against the result to be considered; otherwise his opinion may be like that of the ordinary antiquity enthusiast quite worthless. Especially he should know that to allow it to be stated on his authority that a given specimen came as an original inclusion from a particular stratum, the age of which he names, is to take the risk of telling the world definitely that America was occupied forty thousand years, more or less, before man landed on its shores. It is a question whether any single find of a so-called paleolithic specimen has conformed to the above requirements.

In the near past all rudely shaped stones found even remotely associated with the deposits belonging to or assumed to be of glacial time were classes as paleolithic. Today it is the responsibility of every student of the question of American occupation to diligently inquire whether a single specimen, mineral or osseous, so far collected, either in the United States, in Mexico, Argentina, or Peru, conforms fully to the requirements of science.

A single instance illustrating a dangerous pitfall of this research may be cited: The early explorers of the Delaware River Valley

in New Jersey, reported the discovery of numerous stone "implements" (chipped stones) in the face of the glacial terrace on which the city of Trenton is built. These so-called implements were found in and apparently weathered out of the margin of the gravel deposits, and the archeological world accepted their assignment to the paleolithic age without hesitation. Later this assignment was questioned and it was asked whether the specimens were really original inclusions or whether they were of recent introduction or association. Did the hypothetical occupants dwell on the constantly flooded surfaces during the gravel-forming area, and are these the implements left by them at different levels? Did they visit the spot when the waters were quiescent to get the raw material for their implements, and are these so-called implements the refuse of manufacture? Is it not more likely that twenty-five thousand years later, the Delaware Indians dug into the terrace face to obtain the raw material for their implements as was their custom, leaving the chipped rejectage to be buried in the crumbling terrace margin? This is the story that this and other kindred sites seems to tell. Thirty years ago,

suspecting that our archeologists were merely gathering at Trenton the rejectage of Indian implement making, the present writer had his assistant, who was well qualified for the work, spend several weeks in a deep city sewer excavation which was being cut through these gravels, but not a single specimen of worked stone was discovered. This led to the vigorous challenging of the assignment of the early finds at Trenton to a hypothetical people of hypothetical antiquity, and to the implication that all other like occurrences require corresponding treatment.

So numerous were the stone implement makers of the known American tribes; so fully have they worked every available variety of stone in every section of the country, leaving countless partially-shaped wasters; so deeply have they carried their excavations; and so subject to disturbance by wind and water assisted by the ever-active forces of gravity, that the intermingling of rejectage of shaping work with fragmental superficial formation has been vast beyond estimate.

In closing, I venture to make the assertion that there has

not been collected either in North, Middle, or South America, a single work of art attributed to great antiquity that can stand the test of the scientific requirements here made plain; and the same is true of any other finds, skeletal or otherwise, howsoever confidently announced and by whatsoever authority. This is a challenge though issued with the utmost confidence, quite open to counter challenge, its purposes being to make sure that no unworthy evidence, cultural or chronologic, shall continue to mar the pages of the science of archeology in America.

The fact that explorations up to date, January 1931 and which, according to report, have discovered since manifest, even in the well authenticated post pluvial ? yield nothing different in General Type from the most of the American Indians of Extinct fauna with the total failure to find the paleolithic age in America. It is almost important

To note that the finds of chipped implements attributed to the post-pluvial display a skill in the fracture process, no equal of any from or by any people, all revealed endure ? or [illegible] period is that quite [illegible]

RANDOM RECORDS OF A LIFETIME

DEVOTED TO SCIENCE AND ART, 1846-1931

BY W. H. HOLMES

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